

ESSAYS
ON
INFANT THERAPEUTICS:

TO WHICH ARE ADDED,

OBSERVATIONS ON ERGOT;

HISTORY OF THE ORIGIN OF THE USE OF MERCURY
IN INFLAMMATORY COMPLAINTS;

TOGETHER WITH

THE STATISTICS OF THE DEATHS FROM POISONING IN
NEW-YORK IN THE YEARS 1841-2-3.

BY JOHN B. BECK, M. D.,

Professor of Materin Medicine and Medical Jurisprudence in the College of Physicians and
Surgeons of the University of the State of New-York; Corresponding Member of
the Royal Academy of Medicine of Paris; Corresponding Member of
the Medical Society of London; one of the Vice-Presidents
of the Academy of Medicine of New-York, etc.

SECOND EDITION, ENLARGED AND REVISED.

NEW-YORK:

SAMUEL S. & WILLIAM WOOD,
261 PEARL-STREET.

1855.

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TO THE GENTLEMEN

WHO, DURING THE LAST TWENTY-THREE YEARS, HAVE ATTENDED THE LECTURES ON MATERIA MEDICA IN THE

College of Physicians and Surgeons

OF NEW YORK,

THE FOLLOWING ESSAYS ARE AFFECTIONATELY

DEDICATED BY

THE AUTHOR.

MEMORANDUM.

During the few intervals of ease permitted to the author during the last months of his life, he, at the request of his publisher, prepared the following pages in their present revised and enlarged form. The undersigned performs a melancholy duty in thus bringing this work to the notice of a Profession, which the deceased honored and desired to improve. For the careful revision of the press, the thanks both of the reader and the editor are justly due to Dr. Benjamin W. McCready.

T. ROMEYN BECK,

ALBANY, *July*, 1851.



PREFACE.

The following production, although small in compass, is the result of a good deal of observation and reflection. It might easily have been swelled into a large volume, and made to assume the shape of a systematic treatise. Such was not, however, the intention of the author. With regard to the Diseases of Children generally, we have so many books of established value, as to render unnecessary, at present at least, any additions to their number. Among these, the author would particularly mention the works of EVANSON and MAUNSELL, of Ireland, West of England, and in his own country, those of DEWEES, EBERLE, STEWART and CARDIE. The design of the author was, to notice some prominent subjects which appeared to him not to have sufficiently attracted attention, and concerning which he hoped to offer some suggestions of practical importance. From the manner in which the work has been

received, he is inclined to believe that this object has been accomplished. It appears to have met the approbation of the profession generally, whilst most of the opinions contained in it have been endorsed by the highest authorities.

In preparing it for a second edition, it has been carefully revised and considerably enlarged.

The account of the cases of deaths by poisoning in the city and county of New York, has been introduced with two objects in view: to call the attention of the profession to the importance of having the office of Coroner filled by a medical man, and to show the value of statistical reports of the cases coming under his notice. If these were carefully made and regularly reported, it is believed that much interesting matter would be presented to the public, which is now entirely buried in oblivion, and might possibly result in the enactment of some law to regulate the sale of poisons.

NEW YORK, 14 Le Roy Place.

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ESSAY I.

ON THE EFFECTS OF OPIUM ON THE YOUNG SUBJECT.

As a remedial agent, opium has always and justly been looked upon as one of the most valuable in our possession. It has been styled the "donum Dei," the gift of God to man, and Sydenham says of it, that it is "so necessary an instrument in the hands of a skilful physician, that the art of physic would be defective and imperfect without it; and whoever is thoroughly acquainted with its virtues and the manner of using it, will perform greater things than might reasonably be expected from the use of any single medicine."* High as this panegyric is, it is unquestionably just. Admirable, however, as this agent is, if properly used, it is equally true, that, in unskilful hands, there is scarcely an article in the whole range of the materia medica, capable of producing a greater amount of mischief. That this must be the case, is evident, if we reflect for a moment upon the nature of the effects which it is capable of pro-

* The works of Thomas Sydenham, M. D., with Notes by Benjamin Rush, M. D., p. 115.

ducing, and at the same time, recollect that these effects are not uniformly the same, but are modified by various circumstances. Thus, at one time, we find it operating exclusively as a stimulant, while at another it displays nothing but its sedative power. Given under certain conditions of the system, it quiets irritation, calms the pulse, softens the skin, and promotes balmy sleep. Under other conditions of the system, it quickens the pulse, suppresses the secretions, increases animal heat and disturbs the brain. In the one case, the state of the patient is materially improved; while, in the other, it is rendered worse. It depends then, entirely upon the circumstances under which it is given, whether it will prove salutary or injurious, and it is this which renders a proper use of it a matter which requires so much tact and experience.

Now, the circumstances which modify the action of this agent are numerous. Age, sex, temperament, climate, nature of the disease, stage of the disease, in short, every thing which can affect the condition of the system, modifies, in a greater or less degree, its effects. To understand, therefore, completely the manner in which it operates on the system in its different phases, it is necessary to analyze all these modifying circumstances. On the present occasion, I propose to make a few remarks upon only one of them, viz., *age*, with the view of showing more particularly the peculiarities of its operation on the young subject.

With regard to the effects of opium on young subjects, there are two facts which seem to be well established. The *first* is, that it acts with much *greater energy* on the infant than it does on the adult; the *second* is, that it is more *uncertain* in its action on the infant than the adult. It is in consequence of these peculiarities attending its operation on the infant, that even the smallest quantities have not unfrequently produced the most unexpected and even fatal results. Of this, almost every physician must have seen some melancholy instances. Dr. John Clarke states, that "half a drachm of genuine syrup of white poppy, and in some instances, a few drops of Dalby's Carminative, have proved fatal, in the course of a few hours, to very young infants."* In one case, he says, forty drops of Dalby's Carminative destroyed an infant. Mr. Marley says, "I have known three or four instances where the most dangerous symptoms were produced by Godfrey's Cordial and Dalby's Carminative; two nostrums which have no doubt added considerably to the mortality of infants." In a case that fell under his observation, the most rapid and alarming symptoms followed the exhibition of an ordinary dose of syrup of poppies. In another case, he knew half a small teaspoonful of the syrup of poppies prove nearly fatal to a child eight or ten days old.—Thirty-five drops of Dalby's Carminative, he has

* Commentaries on the Diseases of Children, p. 33.

known to prove fatal to a young child, while, in other cases, larger doses have been given without any unpleasant effects. The same writer relates the case of an infant, nearly poisoned, by considerably less than half an ordinary-sized teaspoonful of paregoric.* Dr. Bard says, he once knew an infant of several months old killed by ten drops of laudanum, and another brought into very great danger by less than two drops.† Dr. Montgomery states that he has known more than one instance in which a teaspoonful of the syrup of poppies has proved fatal to a healthy child.‡ Professor Hamilton relates two cases, in which four drops of laudanum proved fatal to children some months old.§ Dr. Merriman reports two cases, in which a dose of Godfrey's Cordial proved fatal.|| He also states that he once saw a child in the month thrown into a state of excessive stupor, by taking one dose only of a mixture in which there were four drops of laudanum; the actual quantity swallowed, could scarcely have amounted to one drop.¶ Dr. Christison states, that "the administration of three drops of laudanum in a chalk mixture for diarrhoea, to a stout child, fourteen

* On the Diseases of Children, pp. 29, 30, 31.

† Bard's Midwifery, p. 328.

‡ Pereira's Mat. Med., vol. ii., p. 711.

§ A Treatise on the Management of Female Complaints and of Children in Early Infancy, p. 344.

|| Treatise on the Diseases of Children. By M. Underwood, with Notes by Merriman, Hall, and Bell, p. 106.

¶ Ibid. p. 143.

months old, was followed by coma, convulsions and death in six hours." In another infant a few weeks old, death resulted from taking four drops of laudanum.* Dr. Ryan states, that he has known one drop of the "sedative liquor of opium" narcotize an infant.† Pereira says, "laudanum must be given to children with the greatest caution. I have seen a powerful effect produced in a very young infant by one drop."‡ . Of laudanum, two drops have been known to kill an infant, nay, in one case, a single drop destroyed a new-born infant.§ I have myself seen a young child narcotized by about twenty drops of paregoric. The foregoing facts are sufficient to show that opium acts with peculiar energy and uncertainty upon the infant subject. The causes of this would seem to be the following:

In the *first place*, the great difference in the physical organization of the *infant* and the *adult*. In the young subject the brain and nervous system are much more impressible, and the slightest causes, as we know, will sometimes derange them. Besides, in the infant, the circulation is more rapid—there is a greater proportionate quantity of blood circulating in the brain, and hence a much greater tendency to cerebral determinations.—From these peculiarities in the organization of the

* Treatise on Poisons. Second Edition, p. 625.

† Midwifery, p. 477.

‡ Mat. Med., vol. ii., p. 714.

§ London Medical Gazette for 1839, p. 294.

infant, it happens that convulsions are so much more common in the early periods of life. Thus, for example, the irritation of teething—of worms or crude matters in the intestines, is frequently followed by convulsions. Intermittent fever, which in the adult commences with a chill, in the child is frequently ushered in by a convulsion. Scarlet fever, too, in the child, not unfrequently commences with a convulsion, while in the adult I have never witnessed such an occurrence. Now, with such peculiar predispositions characterizing the system in infancy, it may readily be conceived how it is that such an article as opium should act with more power at that period than in after life.

In the *second place*, the difference in the *temperament* or *constitution* of infants. In the adult, we know as a matter of fact, that opium differs greatly in its effects in different constitutions. Thus, as a general rule, the sanguine temperament does not appear to bear the use of this drug as well as the melancholic or the nervous. In the former, it is much more apt to produce cerebral disturbance, and in large doses is more likely to prove injurious. Now, infants differ from one another, as much, if not more, than adults, in these peculiarities of constitution, and, as a matter of course, the difference in the effects of this article must be greater. Besides, as these peculiarities and differences can only be detected by actual experience, and as we cannot of necessity have the same ben-

efit of experience in the case of infants, it is obvious that the difficulty of justly appreciating the action of this drug on the infant must be greatly increased. A greater or less degree of uncertainty, therefore, must necessarily from this cause attend its use in the early periods of life.

In the *third place*, the actual state of the system as to disease. There is no circumstance which modifies the effect of opium in so great a degree as this. In the adult, we see this continually. In some conditions of the system, even small doses produce the most unpleasant effects, while in other conditions, immense quantities may be given with little or no effect; thus, for example, when severe pain or spasm is present, quantities of this article can be borne, which under other circumstances would prove exceedingly injurious. As illustrative of this, I quote an interesting case related by Dr. Percival. He states that a young man was admitted into the Manchester Hospital, on account of a violent spasmodic disease which recurred periodically in the evening, and after trials of various remedies, doses of opium sufficiently large to mitigate the violence of the paroxysm were ordered, and he took twenty-two grains every night during a week, without producing any soporific effect.—On the eighth night he had no return of the spasm. He nevertheless took the opium and in the morning was found dead.* In this case, a great and

* Percival's works, vol. i., p. 422.

sudden change had unquestionably taken place in the nervous system of the patient, and to this must be ascribed the difference of effect. If in the adult, the state of the system makes such a wide difference in the effects of this article, how much more so must all this be the case in the sensitive infant; and it is by not duly regarding this, that such unexpected results sometimes follow from the use of opium. Thus, for example, a child laboring under the acute pain of colic will tolerate doses, which, in the ordinary condition of the system, might prove destructive.

There is one condition of the young subject particularly in which this remedy is frequently resorted to, in which this is strikingly illustrated. I mean that state of exhaustion which arises from diarrhoea and other bowel complaints. In this state the head is very apt to become affected, and if opium be given with a view of checking the intestinal discharges, not unfrequently insensibility gradually creeps over the little sufferer, and in a short time death is the result; and this too, even when the quantity used has been apparently adapted with great nicety to the wants of the case. Every observing practitioner must have witnessed such instances. Now in many cases of this kind, there can be no question that the child sinks under the sedative influence of the opium; and the reason is that in the exhausted state brought on by the disease, the system succumbs much more read-

ily to the narcotic effects of this article, than it does in other conditions of the system.

The foregoing considerations appear to me sufficient to account for the greater power, as well as uncertainty in the action of opium on the infant than on the adult.

If it be a fact then, that opium acts in this way upon the infant, it appears to me to involve inferences of great practical moment, which cannot be too deeply impressed on the mind of the young practitioner.

1. That its use should *be avoided as much as possible* in the young subject. I will not say that it ought to be interdicted altogether, because if given with discretion, it is a remedy of great value in many of the diseases of infants, but it should never be used unless there exists a strong and manifest necessity for it.*

2. Great caution should be exercised in the *form* in which it is administered. No preparation should ever be used, which *is not of a known and determined strength*. In England, the *syrup of poppies* is the preparation most used for children. In this country it is also used, but not to the same extent. This is a pleasant and mild opiate, and is well adapted to children. It is liable, however, to great objections. Besides being apt to ferment and spoil, it is very *variable in its strength*.† On

* See Appendix.

† When properly prepared, *one ounce* of the syrup of poppies is generally estimated to contain about one grain of opium;

this account it is really a very dangerous article; and many cases are recorded (some of which I have already related) in which fatal results have followed the use of it, even in moderate doses. Another objection is, that it is liable to sophistication. Thus a mixture of *laudanum* and *simple syrup*, has sometimes been sold for it. In the London Medical Gazette, (May, 1831, p. 253), a case is related, where a child died in consequence of a small dose of this latter compound having been given by the mother, who had previously given the same quantity of the pure syrup of poppies, with advantage.

The best preparations for children are *laudanum*,* and *elixir paregoric*. These are of known strength, and susceptible of division into the minutest doses. *Dover's powder* is another preparation which may be given to children.† It may

a drachm therefore, contains one-eighth of a grain. From the variable proportions, however, of active principle contained in the capsules of opium, it is impossible to calculate with any degree of precision, the strength of the syrup prepared from them.

* Even this preparation should not be given without circumspection. "When long kept, with occasional exposure to the air, laudanum becomes thick in consequence of the evaporation of a portion of the alcohol, and the deposition of opium. If given in this state, it often acts with unexpected energy, and cases of death have resulted in infants from its use in doses, which would have been entirely safe if the tincture had been clear."—*Wood and Bache's Dispensatory*, p. 1032, 2d ed.

† In a review of the first edition of this work, the Editor of the Dublin Journal of Medicine, Dr. Neligan, makes the following remark in relation to laudanum and Dover's powder :

"Even with these, however, accidents may happen. It is

readily be divided into the smallest doses, and it seems to act much more mildly than equivalent doses of simple opium. It need hardly be stated, that all such articles as Godfrey's Cordial, Dalby's Carminative, &c., should be totally discarded from regular practice. Besides being uncertain in their strength, and on that account exceedingly objectionable, the sanction thus given to them encourages their use by persons out of the profession, who cannot be supposed to be acquainted with the dangerous effects of opium on the infant system.

3. In very young subjects, we should never begin the use of this article except in *very small doses*. Although most practical writers lay down cautions about the use of opium in these cases, yet it does not appear to me that these cautions are sufficiently precise. Most of the writers to whom I allude, specify doses as suitable to certain ages, without stating, that even these doses may, in certain conditions of the system, prove just as injurious as much larger doses. To illustrate, I will quote the directions given by one of our standard

very well known that Dover's powder, when kept, as it usually is, in a bottle, requires to be thoroughly shaken occasionally, to prevent the sulphate of potash from accumulating at the bottom, which would consequently leave an undue proportion of the two lighter ingredients at the top; and further, we have known almost fatal effects from the administration of laudanum which has been kept in an open bottle, where evaporation had taken place to such an extent that each drop was nearly double the ordinary strength of the medicine."—*Dublin Quarterly Journal of Medicine*, Feb., 1850, p. 111.

authorities. Dr. Dewees says, "the proper dose of laudanum for infants and children, may be reckoned at the following rates. Half a drop for a child under ten days old; a drop, for one from that period to the end of the month; a drop and a half, or two drops for one from that period to three months; three drops from this to nine months, &c., &c." "When laudanum is to be used as an injection, we may safely increase the quantity three or four fold." He adds, "These doses are prescribed for children who are altogether unused to the use of this drug; the power of bearing more, may be rapidly increased by habit."* Now, it appears to me that a more dangerous set of directions could not well have been given. Although many children may bear the quantities here specified without injury, yet every now and then a case will occur, in which the most serious results will follow; and it is against these that the necessary precautions should always be taken. In the case of a new-born infant, we are entirely ignorant of the manner in which such an article as this will affect it, and it therefore will not do to begin with *average* doses. To practise safely, we must feel our way with doses much smaller; and then we shall have some guide, and the only guide which the nature of the case admits of, to make the necessary increase in the quantity to be given. Under no circumstances, as a first dose, ought half

* On the Diseases of Children, p. 363.

a drop to be given to a child under ten days—or a drop to a child during the first month. One-eighth of a drop is sufficient to begin with. The quantity, too, directed for an injection is too large. Instead of three or four times the quantity given by the mouth, as far as my experience goes, double the quantity is quite sufficient.*

4. The doses of opium should not be repeated *at too short intervals*. This, too, is a point which is not sufficiently guarded by some practical writers. One writer, for example, after specifying the quantity suitable for a child of two and three months, adds, that “this is not to be repeated in less than an hour.” If this means anything, it means, of course, that after the lapse of an hour, the dose may be repeated with safety. This, however, will not be sustained by experience. Even if a first dose does not narcotize, it frequently produces a degree of listlessness and indifference to food on the part of the child, which, if it be kept up by repetitions of the opiate, may eventually prove just as destructive. This is strikingly illustrated in those states of exhaustion from diarrhœa, where the due supply of nourishment is so essential to recovery. Where repeated opiates are necessary,

* In a recent Journal, (1850), I find the following account of the manner in which opium is used in the Children’s Hospital at Pesth, in Germany, by Professor Schæpf Merce. Although a great advocate for the use of opium in the diseases of children, it shows the extreme caution with which it is prescribed by him :—

“The proportionate dose of opium in very early life, is near-

the intervals between the doses should be long enough to enable the child to recover somewhat from the sedative influence.*

Before concluding these observations, I cannot refrain from making a remark or two in relation to the use of this article by persons out of the profession. The mischief that is done in this way is incalculable. If, in the hands of those acquainted

ly as follows:—To the newly born babe, till it is a week old, I have prescribed it very rarely; from the second to the third week, the medium dose is 1-120th of a grain; from three to six weeks, 1-100th; from six to eight weeks, 1-70th; from two to four months, 1-40th of a grain of the powder. Of the simple tincture of opium, fifteen drops are equivalent to one grain of the powder; and Dover's powder in ten grains, contains one of opium and one of ipecacuanha.

“The action of a proper dose of opium is manifested half an hour after its exhibition, and lasts from three to six hours. If narcotism is induced, it will be serious in proportion to the tender age of the patient. I have seen a single dose of 1-4 gr. of Dover's powder, (equal to 1-40th of a gr. of opium), given to an infant of five weeks, cause narcotism, which lasted for thirty-six hours. The sleep during this period was continuous, profound, interrupted sometimes by starting, as if from fear.—The case, however, terminated favorably. I have seen two cases in which the narcotism caused death. A moderate degree of narcotic action (lasting from six to ten hours), has never, in my experience, seemed dangerous, *when the use of opium has been distinctly indicated.*”—*Monthly Journal of Medical Science for October, 1850.—Lond. and Edin.*

* In a review of the first edition of this work, in the London Medical Gazette, the Editor makes the following observation: “As we have ourselves very recently known an infant of three weeks of age, sick apparently from the administration of one-eighth of a drop of laudanum, we fully concur in the author's cautions, and commend them to the careful study of junior practitioners.”—*London Medical Gazette for August, 1849.*

with its virtues, opium is an article so dangerous and uncertain in its action, what must it be in the hands of the ignorant; and yet we see it given to infants day after day, and night after night, by nurses and mothers, not merely without the consent of the physician, but sometimes contrary to his express injunctions.

There are two ways in which it is used by persons out of the profession, in both of which it proves injurious to the child. The first is by giving it in occasional doses; the second, by giving it constantly. The first is bad enough, but the second is still worse. The first, now and then, unexpectedly destroys a child; the second is followed by a train of the most disgusting consequences, worse, if possible, than those of habitual drunkenness in the adult. Fortunately these latter cases are not of such frequent occurrence; occasionally, however, they are met with where the parent, for the purpose of quieting it, has been induced to keep a child for months under the daily influence of paregoric, Godfrey's cordial, or some other opiate nostrum. In these cases, the effect is to stunt the growth of the child; it is emaciated and puny; the skin is flabby and shrivelled; the lips are bloated and the countenance sallow and wrinkled. There is an absence of all intelligence, and the whole appearance is haggard and aged, presenting a sort of "miniature of old age." Not long since I witnessed a case of this kind, in which a child of fourteen months old did not appear

larger than one of two or three months. With the exception of one month, it had been kept upon paregoric almost every day since its birth. The mother was a poor woman, and on enquiring of her the reason, she stated that she had resorted to this method of keeping the child quiet while she attended to her work.

Of the extent of the mischief annually perpetrated by the unprofessional use of opium, some idea may be formed from a report made to the House of Commons, containing returns from the coroners of England and Wales, of the inquisitions held by them during the years 1837 and 1838, in cases of death by poison. The total number of deaths by poison in these years was 543, of which 52 were very young children, most of them at the breast, in consequence of opium, or some of its preparations having been given by mothers and nurses, in ignorance of its effects. In addition to this, 20 more were destroyed by opium or laudanum administered in mistake for other medicines.*

These facts are certainly appalling; and if any subject connected with medical police is worthy the attention of the public authorities, it is certainly this. How the evil is to be corrected, it is not easy to say. Much, however, might be done by the proper dissemination of information on the subject. In most cases where opium is administered to children by persons out of the profession,

* See *Dunglison's Intelligencer*, vol. iii., p. 299.

it is disguised in the shape of some nostrum, so that they are not aware of what they are giving, and even when they are aware of it, they are not acquainted with the dangerous effects on the infant system. If parents and nurses were made better acquainted with the fact that such articles as Godfrey's cordial, Dalby's carminative, and most of our medicated lozenges and candies, owe all their composing properties to the opium which they contain, and that opium even in small doses is frequently a deadly poison to the infant, one would suppose that it could not but exert a salutary influence in correcting, to a certain extent at least, the evil of which we are speaking, and the dissemination of this kind of knowledge, by the proper authorities, would confer a lasting benefit upon the community.*

* A nurse was recently tried in England, for giving two drops of laudanum to a young child five days old, in consequence of which it died.* A few examples of this kind in this country, would have a most salutary effect.

* For the particulars, see Appendix.

ESSAY II.

ON THE EFFECTS OF EMETICS ON THE YOUNG SUBJECT.

With the exception of cathartics, there is no class of remedies more generally resorted to in the management of the diseases of children, than emetics; and in a large number of cases, there is certainly none more useful. They are active agents, however, and like all agents of this description, are capable of doing good or evil, according to the manner in which they are given. In the use of them, therefore, it is all-important to ascertain whether there is any thing in the young subject which modifies their operation. Unless this is done, it is impossible, of course, to prescribe them with any degree of precision, or even safety. The subject is one of interest as well as of practical importance, although it does not appear to have attracted the attention to which it is so justly entitled. In a previous paper, I endeavored to point out how the effects of opium were modified in the infant subject. On the present occasion, I propose to pursue a similar investigation in relation to Emetics.

As regards *the mere mechanical act of vomiting, young children perform it more easily than adults.* This is a fact which has long been observed by practical men, and about which there can be no question. It is no doubt a wise provision of the Creator to enable the child to relieve itself from the effects of an overloaded stomach, to which it is so constantly liable in the early period of its existence. Although the fact has thus been long known, and the intention of it is obvious, yet the reasons have not been so well understood. They appear to be the two following:

In the first place, from the experiments of Majendie, in relation to the manner in which vomiting is performed, it would seem that in that process, the stomach is in a great measure passive, and that a certain degree of pressure upon it from the surrounding organs is absolutely necessary, before vomiting can be accomplished. This pressure is made by the contraction of the diaphragm from above, and of the abdominal muscles from below, upon the viscera surrounding the stomach. As a matter of course, the pressure thus exerted will be greater or less according to the volume of the viscera. Now, it is well known that in the early periods of life, the abdominal viscera have a much larger proportional size than they have in the adult. This is particularly the case with the liver.* In early life, therefore, during the act of

* According to Meckel the proportion between the weight of the liver and that of the whole body, is as 1 : 18 or 1 : 20, in the

vomiting, the pressure made upon the stomach by the surrounding organs must necessarily be greater than it is in the adult, and in consequence of this, the greater the ease with which the organ is evacuated.

In the second place, the shape of the stomach in the infant is more favorable to the easy evacuation of its contents. That the stomach undergoes successive changes in its shape, from birth onwards, is a fact, which although but recently investigated, is, I believe, well established, and for its elucidation we are indebted to the labors of Prof. Shultz of Germany. His attention seems to have been called to it from the peculiarities which he noticed in the shape of the stomach of those animals which vomit easily, and those which cannot be made to vomit at all. Thus for example, the horse, rabbit, hare, and guinea pig, cannot be made to vomit even by the most powerful emetics, while the dog and the cat throw up very readily—and he found that the shape of the stomach in the two sets of animals was entirely different, and that the same difference exists between the stomach of the child and the stomach of the adult. The former is more of a conical form, drawn out lengthwise, and gradually narrowing towards the two extremities. The œsophagus is inserted into the fundus at the left extremity, and at a distance from the pylorus, leaving the two curvatures of the stomach running

full grown foetus; while in the adult it is as 1 : 35 or as 1 : 36.
—*Meckel's Anatomy by Doane, vol. iii., p. 309.*

almost parallel to each other. In short, the stomach of the child resembles that of the carnivorous animals generally. The latter, i. e. the stomach of the adult, is very different; it is more circular in its form, and the œsophagus, instead of being inserted into the left extremity, is in the middle, between the left extremity and the pylorus. The pylorus, too, is drawn back towards the cardia, so that the small curvature is very short, while the large curvature is greatly extended. The consequence of all this is, that the stomach of the adult has a rounder shape, resembling that of herbivorous animals generally. Now, according to Prof. Shultz, the stomach which approaches nearest to the cylindrical shape, must have its contents evacuated with the greatest ease;* and this would appear to be the case, as a matter of course, whatever theory of vomiting may be adopted; whether performed, as some suppose, by the simple antiperistaltic action of the stomach itself; or according to Majendie, by the contractions of the diaphragm and abdominal muscles alone; or according to others, by the combined action of all these organs.

The foregoing considerations would seem to account very satisfactorily, both physiologically and anatomically, for the fact with which we started, that the mechanical act of vomiting is performed with greater ease in the child than in the adult.—If vomiting, then, be induced in a child by mild

* British and Foreign Medical Review, vol. ii., p. 537.

agents, the whole process is performed with greater facility than by the adult. This, then, is the *first* peculiarity in the effects of Emetics in children.

If, on the other hand, *Emetics of an active and debilitating character, and which produce much nausea, be used, the effects are more uncertain and energetic than in the adult.* The articles to which I allude, are the antimonial emetics, and these accordingly are frequently hazardous to young children, and that, too, when used in doses not peculiarly large. The immortal Sydenham seems to have been fully aware of this fact. In speaking of the continued fever of 1661, 2, 3, and 4, he says, "it has often been a difficulty with me, when called to infants and children in a fever, and observing an emetic indicated, whereby they might have been preserved from danger, that I durst not give them this infusion (*crocus metallorum*), for fear of a bad consequence."* It will be recollected, that at this time *ipecacuanha* had not yet been discovered. Dr. Clarke, of London, states that "a quarter of a grain of tartrate of antimony in solution, has been known to excite a vomiting which has ended in the death of a young child, which before was in no danger."† Dr. Armstrong observes that he "has seen again and again, delirium produced by antimonial preparations, given so as to excite the

* The works of Thomas Sydenham, M. D., with notes by Benj. Rush, M. D., p. 18.

† Commentaries on some of the most important Diseases of Children. By John Clarke, M. D., &c., p. 33.

mucous membrane of the stomach and intestinal canal in very young children.”* Dr. Hamilton advises that “tartar emetic should never be given to infants, for alarming convulsions have followed its use.”† By Mr. Noble, of Manchester, a case is related, in which the death of a child, eleven months old, was owing to the effect of antimonial wine given as an emetic.‡ Mr. Wilton (surgeon to the Gloucester Infirmary) has also reported two cases of children, one a year old and the other four years old, which were manifestly destroyed by the use of antimonial wine given for ordinary colds. Slight convulsions—vomiting—diarrhoea—sudden prostration and death took place, notwithstanding the use of cordials and stimulants.§ I have known a case occurring in this city in which the one-thirtieth part of a grain of tartar emetic given to a child a year old, laboring under croup, produced such severe and protracted vomiting, together with general prostration, as to require stimulants to save life. Some years since I was called to see a child, about three years old, who had been attacked with scarlet fever. The symptoms at first were mild, and no danger was apprehended in the case, when it was suddenly taken

* Lectures by the late John Armstrong, M. D., p. 248.

† A Treatise on the management of Female Complaints, and of Children in early infancy. By Alex. Hamilton, M. D., p. 353.

‡ Provincial Medical and Surgical Journal. By Robert J. N. Streeten, M. D., 1844, p. 47.

§ Ibid, p. 204.

with such alarming symptoms of prostration as to call for a consultation. On inquiry, I found that the attending physician had been prescribing small doses of tartar emetic. Notwithstanding the use of stimulants, the child died in an hour or two after I saw it. I then suspected, and have since been confirmed in the correctness of the suspicion, that the medicine had no little agency in bringing about the fatal result. The child was naturally delicate, and there certainly was nothing in the symptoms of the case to account for such a termination. The foregoing facts would seem sufficient to show the *uncertainty* as well as *energy* with which tartar emetic operates on the young subject, and the causes are obvious.

In the first place, tartar emetic is a powerful sedative,* and it is well known that in early life, the system cannot bear so well the operation of this class of agents, as it can in the adult. A striking illustration of this we have in blood-letting when carried to the extent of producing syncope. Adults, as a general rule, recover very readily from this state; children, on the contrary, recover very slowly, and there is always more or less danger to life either from convulsions or general prostration, and the same thing holds good in relation to tartar emetic. Besides this, tartar emetic frequently acts as a local irritant. From the delicacy of the mucous tissue in early life, it is of

* Appendix.

course more apt to act as such at that period, than it is in advanced years. In both these ways, it is evident that tartar emetic must necessarily prove more energetic in its action on the young subject.

In the second place, there is scarcely any medicine, whose action is more decidedly modified by the existing condition of the system than tartar emetic. In the ordinary state of the system, it acts as a sedative to the circulation, but at the same time causes, even in very moderate doses, nausea, vomiting, sometimes free purging and diaphoresis. On the other hand, in certain states of the system characterized by high inflammatory action, very large doses, and frequently repeated too, may be given without any other effect than that of lessening excitement and curing the disease. Again, as soon as this state of excitement is subdued under the use of the remedy, all the ordinary physiological effects of it are reproduced. Under these circumstances the article can no longer be tolerated, and the use of it must be relinquished. All these interesting peculiarities are abundantly illustrated in the treatment of pneumonia, as first practised by Rasori in Italy, then by Laennec in France, and afterwards by numerous English and American physicians. Now, if tartar emetic is thus modified in the adult by the existing state of the system, how much more readily must all this take place in the young subject. In the successive changes taking place in the child in the different

states of disease, from irritation to inflammation, it is hardly possible to estimate the degree of uncertainty attending the operation of this article.

Again, vomiting, we know, depends very much upon the existing condition of the nervous system. In certain conditions of the brain and nerves, it takes place very readily, while in others it is almost impossible to excite it, even by the most powerful means. For example, when the system is under the influence of some narcotic, such as opium, everybody is aware how difficult it is to bring on vomiting; and the same thing occurs in other morbid states of the nervous system, such as apoplexy, &c. Notwithstanding this, it has been observed, that if under these circumstances, large quantities of tartar emetic be given, or if the use of it be too often repeated, although vomiting may not be induced, yet there may remain sensibility enough in the system to enable it to operate as a poison. An interesting case illustrative of this is related by Cloquet, of a person laboring under apoplexy, who received into his stomach upwards of forty grains of tartar emetic, without producing either nausea or vomiting. On dissection, besides the morbid state of the brain, extensive lesions were found in the alimentary canal, which were attributed to the action of the tartar emetic retained in the stomach.* Dr. Christison quotes a case from the *Edinburgh Medical and Sur-*

* Paris and Fonblanque, Medical Jurisprudence, vol. ii., p. 280.

gical Journal (vol. vii., p. 305), in which a scruple of tartar emetic was given to a person poisoned by opium, without producing any effect as an emetic; sulphate of zinc was afterwards given, and with success. As he recovered from the effects of the opium, he was seized with pains in the stomach and bowels, and with tenesmus, which lasted several days.* Now, it must be evident that in the young subject, all these results are much more likely to occur, than in the adult.

While tartar emetic operates in this way on the young subject, ipecacuanha is never known to be followed by any injurious consequences. To the youngest infant it may be given not only with impunity, but frequently with the greatest benefit. Why this is so, must be manifest, if we reflect for a moment upon the peculiar properties of the two articles. Although both are emetics, yet they differ widely from each other in many important respects. The one is a mild article and limited in its operation to the stomach, upon which it never produces any thing like local irritation, even when given in large doses. The other, besides acting as a powerful emetic, is a direct sedative, capable of producing general prostration, and in some cases acting as a local irritant to the stomach and bowels, showing itself in excessive vomiting and diarrhoea.

With regard to the manner in which tartar

* *Elements of Medical Jurisprudence.* By T. R. Beck, M. D., and J. B. Beck, M. D., vol. ii., p. 586.

emetic proves so dangerous to infants, it is probably more by its action as a sedative, than as a local irritant. This may be inferred from the symptoms attending those cases, as well as from the appearances on dissection. In the two cases recorded by Mr. Wilton already alluded to, the main symptoms were those of collapse, and on dissection no appearances of inflammation could be detected either in the stomach or intestinal canal. In the case, however, related by Mr. Noble, on dissection, evidences of local inflammation were found in the mucous membrane of the ileum.*

The foregoing, then, appear to be the important peculiarities in the effects of emetics on the young subject. While vomiting, induced by ipecacuanha and other mild means, is performed with greater ease than by the adult and does not injuriously affect the system, the vomiting induced by tartar emetic is frequently followed by severe symptoms, and sometimes proves fatal.

* Provincial Journal for 1844, p. 48.

The same fact has been observed in Germany. Professor Schæpf Merei of Pesth, of the Children's Hospital at that place, says: "I have seen the administration of one quarter grain of tartar emetic, in two ounces of water, cause the death of a child two weeks old, by inducing intractable hyperemesis. But children, of several weeks or months old, sometimes die when an emetic is administered which is too strong or ill-timed. In the Hospital at Pesth, I had several cases of death from profuse diarrhoea, provoked by tartar emetic, viz: in children who, in spite of the emetic, did not vomit, but had twenty or thirty stools in rapid succession; the purging could not be arrested, and caused in a few hours death by collapse." —*Monthly Journal of Medical Science*, Oct., 1850.

Now the due understanding of these peculiarities is evidently of the highest importance in the use of emetics in children, and upon the mind of the student and young practitioner especially, they cannot be too deeply impressed. From the manner in which medicines are treated of in classes, in most of the books of *Materia Medica*, and in the lectures on that subject, the student is insensibly led into the belief of a greater resemblance between them than really exists in nature, and it is only after he has had some experience of his own, that the error is corrected. He cannot, therefore, too early in his career, learn that all classifications are artificial—not founded in nature—that medicines are arranged in classes, merely for the sake of convenience, not because the articles under each class are precisely alike, but because they resemble each other in some one or more important feature, while in other respects they differ greatly. No two medicines, even in the same class, are precisely similar, and, in acquiring a knowledge of them, the study of the points of difference is even more important than those in which they resemble each other.

From the foregoing considerations, the following inferences may be deduced.

1. As a general rule we need not be afraid of vomiting the youngest child, provided the means used be mild—such as *ippecacuanha*, &c. The mere act of vomiting is attended with no danger, while the remedial agency of an emetic is one of great

power and value. Besides acting on the stomach, it extends its influence to the mucous membrane lining the pulmonary organs, promoting secretion in the first place, and then aiding in dislodging and ejecting morbid accumulations; accordingly, in pulmonary affections, there is nothing so efficacious. During the first week or two after birth, the best plan perhaps is, if vomiting is indicated, to excite it by giving a little tepid water and then tickling the fauces with a feather.

2. The vomiting induced by the preparations of antimony ought to be resorted to with great caution in very young children, and should never be used except in those cases where a sedative effect is required, and can be borne with safety. Inflammatory excitement ought then always to be present to justify its use in a young child. Where the object is simply to evacuate the stomach, it ought never to be thought of. In such cases as croup and pneumonic inflammation, it may be justifiably and beneficially used. In these cases it will be found, that the system can bear the sedative influence of the article much better than it can in the ordinary conditions of the system.* Even

* With regard to the use of tartar emetic in croup, Dr. Stokes, of Dublin, makes the following statement: "For the introduction of this inestimable remedy in the treatment of the croup, the science is indebted to Dr. Cheyne. In his essay on Cynanche Trachealis, published in Edinburgh in 1801, we find the treatment recommended; and it is no small evidence in its favor, that in the year 1832, after an experience greater than falls to the lot of most men, the opinions of this philosophical investigator of disease have remained unaltered. How changed

here, however, care should be taken not to push the article too far, as dangerous collapse has been known sometimes to be the result.

3. The *continued use* of tartar emetic in young subjects cannot be too specially guarded against. It is in this way, probably, that it is so apt to prove injurious. A single dose, even though it vomits very freely, may be borne with comparative impunity, while the repetition of it may keep up nausea and intestinal irritation, so as to cause injurious prostration. This is very likely to happen in cases of a chronic character, like whooping-cough. Although mild emetics are among our best remedies in this disease, and where the subject is old enough, a single emetic of antimony is frequently exceedingly beneficial, yet the repeated use of antimonial emetics, as is too often the case,

would be the character of medicine, if, in support of many of our remedies, there could be brought forward such evidence, and such an advocate.”—*Diseases of the Chest*, p. 144, *Am. Edition*.

Without wishing to detract from the merits of Dr. Cheyne, it is very certain that the use of tartar emetic in croup was a common practice in this country many years before Dr. Cheyne published his Essays. In 1781, Dr. Richard Bayley, of New York, published “Cases of Angina Trachealis, with the mode of cure, in a letter to William Hunter, M. D.,” &c.; in which he recommends the “*free use of tartar emetic*.” The practice I believe originated with Dr. Bayley, and appears to have been generally adopted in this city. In an Inaugural Dissertation on the Cynanche Trachealis, published in 1793, the late Dr. Samuel Borrowe, of this city, recommends *tartar emetic* in the most emphatic terms. Appended to the Dissertation five cases are detailed, in all of which the tartar emetic was used, and with the happiest success.

appears to me to be a great error in practice. It is not indicated by the nature of the symptoms, and violates a great rule which ought always to be observed in the management of chronic cases, and that is, not to break down unnecessarily the strength of the patient.* Again, in ordinary catarrhal affections in children, a great deal of mischief is frequently done by the continued use of expectorant mixtures containing this active article. The hive syrup of Dr. Coxe, which is now in every family, and is given on the slightest occasions to infants, without even consulting a physician, has, I am convinced, done a great deal of harm. I say this without wishing to undervalue this preparation. In proper cases it is really a useful article, but persons out of the profession ought to know that its principal efficacy is owing to the quantity of tartar emetic which it contains, and that the indiscriminate use of it in cases where mild articles are required, must be injurious.†

4. As the effect of tartar emetic on the system

* Dr. Armstrong says that "it is a most notorious fact, that the whooping-cough is far more fatal in London than in the country; and I believe," he adds, "that this arises from the very free use of antimonials in London."—*Lectures*, p. 248.

† Every ounce of Coxe's hive syrup contains one grain of tartar emetic. My friend, Dr. McCreedy, has communicated to me the particulars of a case in which a child between four and five years of age, laboring under whooping-cough, manifestly sunk under the too frequent use of this article. The exhibition of it had been continued about eight days, when symptoms of intestinal irritation came on, accompanied with great general prostration, which in a few days ended the child's existence.

cannot always be measured by its emetic operation, even in the adult, this fact ought to serve as a caution against the too common practice of giving repeated doses of it to produce vomiting in children, when they happen to be narcotized. While it fails to vomit, it may still operate as a poison to the system. In all cases of this kind, the proper method of treatment is, not to push the emetic, but to endeavor to restore the sensibility of the patient, and then sometimes vomiting comes on at once.*

* The following case will illustrate more fully what I mean. Some time since I was called to a young child, to whom its mother had given twelve drops of laudanum, instead of paregoric. Discovering her mistake shortly after, and being alarmed at the effects produced on the child, she sent for assistance to a neighboring apothecary, who directed the administration of antimonial wine. A teaspoonful of this was accordingly given, but without the least effect in exciting vomiting. Shortly after this, and about one hour after the laudanum had been given, I first saw the child, and found it in a state of stupor from which it could not be roused by any ordinary means. With a view, if possible, of still exciting vomiting, I immediately administered a large dose of ipecacuanha. After waiting for some time, and finding no effect, I commenced pouring cold water from a pitcher on the child's head, which was held over a tub. In a very short time the child seemed to feel the impression of the water, and exhibited symptoms of returning sensibility. On stopping the application of the cold effusion, it speedily relapsed into its former state of stupor. The water was again poured on the head, which soon roused it again, and during its use it vomited very freely. I now suspended its use for ten or fifteen minutes. Finding the symptoms returning, recourse was again had to the water, and with the same effect. It roused the child and again brought on vomiting. After this it gradually revived, and the next morning was as well as usual.

5. In using tartar emetic in children, especial regard should be had to their constitutions. In those naturally delicate, and especially where the scrofulous diathesis exists, it should never be used if it can be avoided. Prostration is much more apt to ensue in them, and where the article is persisted in for any length of time, is sure to do harm. It is in such constitutions, when laboring under hooping-cough, and where the use of this article has been too long continued, that the baneful effects of it are most strikingly observed.

6. It is perhaps hardly necessary to say that if tartar emetic be an article of such danger, the younger the subject to whom it is given, the more likely is it to do harm. In children under a year, I should say, as a general rule, it ought never to be used.* During that period the powers of life are too feeble to bear so active a remedy, at the same time that all the beneficial effects of an emetic may be gained from the use of ipecacuanha, or even milder means.

* In the review in the London Medical Gazette, already alluded to, the Editor says :

“Those who have witnessed its poisonous influence (tartar emetic) on the young subject, will concur with Dr. Beck, in laying down the rule, that it ought never to be administered to children under one year old ; and to others only rarely.”—*London Medical Gazette for August, 1849.*

ESSAY III.

ON THE EFFECTS OF MERCURY ON THE YOUNG SUBJECT.

In the previous essays, I have endeavored to point out the peculiarities attending the operation of opium and emetics, on the infant subject, as distinguished from the effects of these agents on the adult. I now propose to make some remarks on another article of even still greater importance, and that is *mercury*.

That mercury is an agent of immense power, either for good or evil, upon the human constitution, cannot be questioned. While in many cases it is the means of saving life, in not a few it unquestionably destroys it. If this be so, it becomes a question of the deepest practical interest, to determine whether its action is modified in any way by the age of the patient, and particularly so, when it is recollected that it is given by too many physicians, even more freely, and may I not add indiscriminately, to the young subject than to the adult.

The first and most striking peculiarity attending the action of mercury, is that, in young subjects, it does

not produce salivation so readily as it does in adults. Indeed, under a certain age, it appears to be exceedingly difficult to excite salivation at all in them. On this point, besides our own experience, we have abundance of testimony. Dr. Clarke says, "under various circumstances he has prescribed mercury, in very large quantities, and in a great number of cases; and he never produced salivation, except in three instances, in any child under three years of age."* Dr. Warren, of Boston, observes, "that he has never known an infant to be salivated, notwithstanding he has given in some cases, large quantities with this view."† Mr. Colles, of Dublin, says, "no man in the present day requires to be told that mercury never does produce ptyalism, or swelling and ulceration of the gums in infants."‡ Drs. Evanson and Maunsell speak still more strongly. They say, "mercury does not seem capable of salivating an infant. We have never seen it do so, nor are we aware of any such case being on record." "We have never succeeded in salivating a child under three years of age."§

The same general fact seems to be applicable to

* Commentaries on some of the more important Diseases of Children. By John Clarke, M. D., p. 182.

† View of the Mercurial Practice in Febrile Diseases. By John Warren, M. D., p. 146.

‡ Practical observations on the Venereal Disease and on the use of Mercury. By Abraham Colles, M. D., p. 171. Amer. edition.

§ Treatise on the Management and Diseases of Children, p. 88.

the external use of mercury. Dr. Percival, of Manchester, remarks, that he "repeatedly observed that very large quantities of the unguentum coeruleum may be used in infancy and childhood, without affecting the gums, notwithstanding the predisposition to a flux of saliva, at a period of life incident to dentition."*

That salivation does not take place so readily in the infant as in the adult, would seem then to be well established. That it never can or does take place, as might be inferred from some of the preceding quotations, is by no means, however, true; and the statement, if implicitly relied on, is calculated to be the cause of much mischief. That very young subjects do sometimes become salivated, is unquestionable. One case, and only one, however, has occurred in my experience, in which a child of two years of age was salivated, and that by a very moderate quantity of calomel, viz., five grains, given in three portions, at intervals, within the space of about twelve hours. In about two days after, the gums became inflamed, the tongue swelled, several ulcers appeared in the mouth, and the flow of saliva was free; after continuing about three days in the same state, it gradually yielded, and disappeared without any further inconvenience. In this case every thing seemed favorable to the development of mercurial action. The child had been laboring under hooping-cough for

* Essays, Medical and Philosophical. By Thomas Percival, M. D., vol. 2, p. 318.

several weeks, and was a good deal reduced. It vomited freely with every paroxysm of coughing, and this no doubt aided in bringing on salivation, in a constitution peculiarly sensitive and evidently scrofulous. Nor is this a solitary instance. Dr. Clarke, already quoted, admits that in three cases, salivation was produced in children under three years of age. And similar cases have been observed by others. Dr. Percival relates the case of a child affected with hydrocephalus, aged only seven months, in whom salivation was induced by rubbing ten grains of mercurial ointment into the thighs every three hours. After the use of two scruples of the ointment, the mouth became affected. The salivation was not violent, however, and had no effect in preventing a fatal result.*

This, then, is a remarkable peculiarity in the action of this agent upon the infant subject, and the observation of it has doubtless led to the belief, too prevalent among some physicians, that it may be given to them to almost any extent with perfect impunity; an error, which, if not in its immediate, yet certainly in its remote effects, has been the prolific source of more mischief, probably, than any of us are aware of.

Although mercury so seldom salivates infants, yet, notwithstanding this, it cannot be doubted that it affects the system profoundly, and even more so proportionally than it does the adult. That it should do

* *Essays, &c.*, vol. 2, p. 409.

so appears perfectly natural, when we reflect upon the mode of its operation on the human system. On this subject, I am aware that a great difference of opinion exists. By some, mercury is looked upon as a stimulant; while others view it as a sedative. A familiar acquaintance with its effects, however, will show, I think, that it may be the one or the other, according to circumstances—according to the dose in which it is given—the length of time it is continued, and more especially, the condition of the system at the time of using it. A single large dose of calomel will cause nausea and relaxation, and sometimes unpleasant prostration, while if it be given in smaller doses and repeated frequently, it will occasion irritation of the intestines, and general disturbance of the vascular and nervous systems. In the former case acting as a profound sedative, and in the latter as a stimulant, or rather irritant. That calomel given in large doses operates as a sedative, seems to be proved, not merely by the nausea and prostration which it frequently produces, but by other considerations. In dysentery, for example, in the adult, a dose of twenty grains of calomel will sometimes allay pain and irritation, with as much certainty as a dose of opium. For the purpose of testing the effects of calomel, some interesting experiments were made by Mr. Annesley, which would seem still further to show, that in large doses the action of this agent upon the mucous membrane of the stomach and intestines, is that of a sedative.

He took three healthy dogs, and gave to one, 3j. of calomel, to a second 3ij., to a third 3iij. After this they were tied up in a room.

"The dog which took 3j. did not appear to feel any kind of sickness, till six or seven hours afterwards, when he vomited a little. He was lively the whole time, and ate his food well; had been purged two or three times; dejections of a black grey color.

"The dog which took 3ij. was likewise lively, and ate his food well, vomited two or three times, and was purged more than the other; he passed tape worms and the dejections were black.

"The dog which took 3iij. was heavy and apparently uncomfortable the whole day, and did not vomit at all; he was purged, and passed a very long tape worm; dejections also black."

Twenty-four hours after they had taken the calomel, the dogs were all hung, and five minutes after they were dead, they were examined, and the vascularity of the stomach was found to be in the inverse ratio of the calomel they had taken; i. e. in the dog which had taken 3iij., the vascularity was the least, and so on. For the purpose of comparing this with the condition of the stomach of a dog which had taken no calomel at all, an examination of another dog was made; and here the stomach was found to be *more vascular* than in any of the others. From these experiments, Mr. Annesley drew the conclusion, that "the natural and healthy state of the stomach and intestinal

canal is that of high vascularity, and that the operation of calomel in large doses, is directly the reverse of inflammatory."*

The foregoing considerations would seem to show that calomel in full doses is a local sedative, and in its general effects, is debilitating to the system at large. Hence its great utility and value as a remedy in many inflammatory diseases.

When, on the other hand, it is given in small and repeated doses, it acts not unfrequently as a local, as well as a general irritant, producing immoderate action of the bowels, and general irritation of the nervous and vascular systems. Now these, we know, are the effects observed continually in the adult, and it is but reasonable to suppose that all of them must, as a matter of course, be aggravated in the more delicate and sensitive system of the infant.

What shows incontestibly that the action of mercury is actually more energetic on the infant than the adult, is the fact, that when salivation does take place in the former, as it sometimes does, its effects are most disastrous. Sloughing of the gums and cheeks, general prostration and death are by no means uncommon occurrences. On this subject, Dr. Blackall justly remarks, "a general opinion prevails, that the constitutions of young subjects resist mercury. Its entrance into the system they certainly do resist, more than we

* Transactions of the Medical and Physical Society of Calcutta, vol. 1, p. 211.

could expect; but they are greatly overcome by salivations, and the possible occurrence of such accidents may well set us constantly on our guard."* Dr. Ryan, too, says, "Ptyalism of infants is often followed by sloughing of the gums and cheeks; and this I have known to occur after the use of it in hydrocephalus."†

Besides being more energetic in its action on the infant, mercury is also more uncertain. This must necessarily be the case, and for the same reasons that every other active agent is so. In the adult we know that mercury varies in its effects, according to the condition of the system, and the peculiarities of the patient's constitution. Thus some persons are salivated by the smallest quantity of this metal, while others resist the influence even of the largest quantities. In some, febrile action; in others, diarrhoea and exhaustion

* Observations on the Nature and Cure of Dropsies. By John Blackall, M. D., p. 126.

† Manual of Midwifery. By Michael Ryan, M. D., p. 477. Dr. West, in his lectures on the Diseases of Infancy and Childhood, says, "In infants and children under five years of age, the gums hardly ever become affected by mercury, even though most energetically employed, and it has never yet occurred to me to meet with an instance of profuse salivation or dangerous ulceration of the gums. Such accidents, however, do now and then occur, and have been known to terminate in fatal gangrene of the cheek, or necrosis of the jaw. On this account, therefore, you must watch the condition of the gums in infants and children to whom you are administering mercury, just as you would do in the case of the adult, and diminish or discontinue the remedy on the first indication of their being affected."—*Lond. Med. Gazette*, for 1847, p. 1050.

take place, even from moderate doses. Hence it is, that every prudent physician, if unacquainted with the previous history of his patient, makes it a special subject of inquiry to ascertain whether he has ever taken mercury previously, and how it affects him. Now, in the young infant, of course, as we cannot so well have the benefit of this information, more uncertainty must necessarily attend its operation.

These, then, are the peculiarities attending the operation of mercury on young subjects, viz., that they are salivated with great difficulty, and that notwithstanding this, the effects of it are frequently more energetic and uncertain, than they are in the adult. And it is upon these as the basis, that I propose to make a few remarks bearing upon the practical application of it in young subjects.

1. If salivation occurs so rarely in children under a certain age, then it is evident that it can never be made a criterion by which to judge of its influence on their systems. To attempt, therefore, to produce this effect, as we do in adults, is manifestly improper. In cases where it is desirable to get the system under the full influence of the remedy, other modes must be resorted to for the purpose of judging to what extent the use of the article should be carried. Now this is by no means easy. Even in adults, where we have the benefit of salivation as a test, all practical physicians are aware how difficult it is frequently, to decide when it is proper to stop the use of the

remedy. How much more must this difficulty be increased in the young infant, where we are left without this guide. The only modes of judging, of course, are the character of the evacuations from the bowels, and the general impression made upon the disease for which it is administered. Both these are evidently, however, uncertain. It is to be feared, therefore, that for the want of a more certain guide than we at present possess, the use of this remedy is, in many cases, unnecessarily protracted to the great detriment of the little patient. From all this the conclusion is obvious, that in the use of this article in the young subject much greater caution is necessary than in the adult.

2. The fact that mercury may prostrate and destroy a young child, even though it does not cause salivation, it is to be feared is not sufficiently appreciated, at least by some. I have known calomel given without weight or measure, to a young child, and the reason assigned to justify it was that it could do no harm, because it would not salivate. Now it appears to me that no opinion can be more unfounded, and no practice more mischievous. Although a single dose of calomel, even though large, may be well borne by children of ordinary strength of constitution, yet even this is not entirely safe in all cases. And when these doses are frequently repeated, particularly in delicate habits, the most serious consequences may result.*

* In his valuable little *Compend of Practice*, M. Bedingfield

3. The use of mercury in young subjects as an alterative, should in all cases be conducted with great caution. There is no practice more common than that of continuing the use of this agent in small doses, for a considerable time, and certainly none which is more liable to abuse. Under the idea that the dose is so small and from no salivation appearing, we are apt to infer that even if the medicine is not doing any good, it is certainly not doing any harm. Any improvement, too, which occurs during the use of the article, is sure to be attributed to the silent operation of it on the system. Now although this is not unfrequently the case, yet it is not invariably so; and every observing physician must have been aware of cases, in which in this way, the article has been unnecessarily and injuriously continued. In bowel complaints, under the idea of altering the secretions, it has frequently, no doubt, helped to keep up the very intestinal irritation which it was given to correct. In other cases it has developed

makes the following remarks: "Children will take an immense quantity of mercury without the salivary glands becoming affected. We ought not, however, on this account to give it incautiously; for it will sometimes happen, that without salivation, the parotid duct will be excited by it into violent inflammatory action, in which the parotid gland and the whole cheek will be speedily involved, and sphacelus, or rapid ulceration, will be the consequence. I have seen both cheeks entirely removed by this process. Nothing with which I am acquainted has the slightest tendency to check its progress." *A Compendium of Medical Practice.* By James Bedingfield. Am. ed., 1823, p. 170.

the latent tendency to other diseases, such as scrofula, phthisis pulmonalis, etc. In adults we know this to be very often the case. How much more likely is all this to happen in the young infant.

4. In the use of mercury in young children, great care should be exercised in ascertaining, as far as possible, their constitutional peculiarities. This, of course, is not in all cases easily to be done. A good deal, however, may be learned from an acquaintance with the tendencies of the parents. Wherever the parents show indications of scrofula, or where there is an hereditary predisposition to consumption, great caution ought to be exercised in the use of mercury in their offspring.

5. Mercury should be administered with great caution, in cases where a child has been sick for a considerable length of time, and when the strength of the child has been very much reduced. In this state of constitutional depression, a single cathartic dose of calomel sometimes proves fatal. We think we have seen more than one case, in which a child has been irretrievably prostrated under these circumstances, under the false impression that calomel is an innocent purgative to a child.

6. The too common practice of giving calomel as an ordinary purge, on all occasions, is certainly unjustifiable. From the facility with which it may be given, it is unquestionably resorted to in a great number of cases, where it is unnecessary, and in a great number where it positively does harm. The

misfortune is, that its use is not limited to an occasional dose, but it is too often given in every slight indisposition of the child. Now, in this way, there can be no question that the use of it has laid the foundation for the ruin of the constitutions of thousands. It ought to be a rule laid down and rigidly followed, that in very young children, mercury ought never to be used as a cathartic, unless there is a special reason for resorting to it. In a great majority of cases, milder cathartics are decidedly to be preferred.

In concluding these observations, I trust it may not be supposed, that my intention has been to undervalue the importance of mercury as a remedy in the diseases of children. On the contrary no one appreciates it more highly than myself. In many cases, nothing can supply its place, and its judicious use has been, and is, the instrument of saving multitudes of lives. Notwithstanding, however, the many cautions to the contrary, it is to be feared that the use of it is still too general and indiscriminate. Indeed, the amount of it which is taken by the human race in one way or other, is incalculable. What is given by regular physicians, is perhaps the smallest quantity. If the public really knew how much of this article is swallowed unknown to themselves, in the shape of bilious pills, worm lozenges, and the white powders* of

* Several cases have occurred in which these white powders have caused salivation.

the homœopaths, they would be amazed at their credulity in deserting their old medical advisers, because they have the boldness to give them an occasional dose, and the honesty to tell them so.

In addition to the peculiarities already mentioned in the preceding remarks, in relation to the action of mercury on the young subject, its effects when applied to the skin are not unworthy of notice. It is well known that one of the best modes of introducing mercury into the system, is by friction. On the infant subject, however, when applied in this way, it appears to operate even more kindly and efficiently than it does on the adult. This, therefore, is the best method of using it, where the constitutional effect of the article is needed in the young subject. On this point, the suggestions of Sir Benjamin Brodie are so important, that I cannot refrain from quoting them in full. "Children," says he, "when born, sometimes labor under syphilis, the father or mother having been affected with it—perhaps the father and not the mother. The child, at birth, looks thin, and is of small size; instead of thriving, it becomes still thinner. At the end of three weeks it is covered by a nasty, scaly eruption; there is a sort of apthæ in the mouth, and chaps about the limbs and anus. I have tried different ways of treating such cases. I have given the child grey powder internally, and given mercury to the wet nurse. But mercury, exhibited to a child by the mouth, generally gripes and purges, seldom doing

any good; and given to the wet nurse, it does not answer very well, and certainly is a very cruel practice. The mode in which I have treated such cases for some years past, has been this: I have provided a flannel roller, on one end of which I spread some mercurial ointment—say a drachm or more; and I have applied the roller thus prepared, not very tight, round the knee; repeating the application daily. The motions of the child produce the necessary friction, and the cuticle being thin, the mercury easily enters the system. This causes neither griping nor purging; in a child, it does not even, in general, cause soreness of the gums, but it cures the disease. Very few of those children ultimately recover in whom the mercury has been given internally; but I have never seen a single case in which this other method of treatment has failed.”* A reviewer in the *British and Foreign Review*, states, that the same mode has been resorted to by him in two cases of hydrocephalus, with decided success. In these cases, strong mercurial ointment was spread on each leg, every twelve hours, and covered with a stocking made to tie lightly above the knees.†

* Braithwaite's *Retrospect*, vol. 9, p. 113, vol. 14, p. 134.

† Braithwaite, vol. 14, p. 134.

ESSAY IV.

ON THE EFFECTS OF BLISTERS ON THE YOUNG SUBJECT.

It has frequently struck me that a treatise, describing with the necessary precision, the peculiarities of the effects of medicinal agents on the young subject, as distinguished from their effects on the adult, has long been needed in our profession. As yet I know of no such work. The systems of *materia medica*, valuable and elaborate as they are, and in which we should naturally look for the requisite information, are confessedly deficient on this subject. The consequence is, that the young practitioner who depends upon them, finds himself continually embarrassed in the treatment of the diseases of children, and he is obliged after all, to rely upon the incidental observations gathered from works on general practice, or upon the slow accumulations of his own experience. Even works professedly on the diseases of children, do not supply the want. They indeed specify doses suitable to the age, and now and then give cautions in relation to the use of certain medicines, but they do not enter into the philosophy of the

subject as it ought to be engaged upon. It is treated by them more as a matter of enlightened empiricism, than as one founded on sound and rational physiological and pathological principles. In some previous papers, I have endeavored to offer some contributions on this subject, and should they be the means of inducing some experienced hand properly to elaborate it, it appears to me that a greater practical benefit could not be conferred on the profession. On the present occasion, I propose to make *blisters* the subject of a few remarks.

The first peculiarity attending the operation of blisters on the young subject is, *that they produce their effects in a shorter time than they do in the adult.* This is a fact well known to every practitioner. While in the adult, they do not produce their effects until from eight to twelve or even more hours have elapsed, in the child the same takes place in from two to six hours. In this respect there is a striking difference between blisters and most other remedies. Emetics and cathartics, for example, do not appear to act with any more rapidity on the child than they do on the adult. Now this fact, of the more prompt action of this class of agents upon the child, although a simple one, is nevertheless one of great importance, and one which should be continually borne in mind. It has a practical bearing, not merely upon the mode of conducting the process of blistering in young subjects, but also upon the use of it in their various diseases.

The second peculiarity is, *that the local inflammation produced by a blister is greater in the young subject than in the adult.* The reason of this is obvious. In infancy, the skin is more delicate in structure, has greater vascularity, and a higher degree of sensibility; all circumstances favoring the development of greater inflammation. The local impression, accordingly, made by a blister, is not merely more rapidly developed in the young subject, but it is also more intense.

The third peculiarity is, that in young subjects *blisters are more apt to be followed by the injurious consequences of inflammation, such as ulceration, gangrene, and even death.* Numerous and melancholy instances of this are to be found on record. Dr. Ryan, speaking of the use of blisters in children, says, "I have seen a blister on the chest followed by sloughing, and an aperture form over the epigastrium, which exposed the subjacent viscera."* Dr. Thompson states, that he "has seen gangrene and death follow the application of a blister on an infant."† Dr. North states that he has "twice known infants destroyed in consequence of the sloughing of blisters, the progress of which could not be arrested."‡ Professor Chapman remarks, that in children a blister "some-

* Manual of Midwifery, &c. By Michael Ryan, M. D., p. 476.

† Materia Medica. By Anthony Todd Thompson, M. D., vol. ii., p. 535.

‡ Practical Observations on the Convulsions of Infants. By John North, p. 202.

times induces gangrene, as I have witnessed in two or three instances.”* My friend Dr. W. C. Roberts informs me, that he has met with two cases in which children sank under the effects of blisters. Numerous other facts of a similar character might be adduced, to show the disastrous effects which sometimes result from the application of blisters to children; and to the minds of many physicians, it constitutes a serious objection to their use in their diseases. Dr. Armstrong says, “I have a great dread of the application of blisters to infants, on account of what is called the local and constitutional irritation.”† Now these occurrences may and do take place also in the adult, but they are comparatively rare, and only under very peculiar conditions of the system. In infants, on the contrary, they are by no means uncommon. In any child, however healthy, they may occur from the simple cause of their being left on too long. They are more likely to take place, however, in certain conditions of the system or of the skin itself. Thus, for example, in cases where a child is greatly emaciated, or the constitution broken down from various causes, the inflammation of a blister is very apt to become unhealthy in its character, and to be followed by injurious consequences. Then again, where the skin itself is in a diseased state, it is much more

* *Elements of Therapeutics, &c.*, vol. ii., p. 28.

† *Lecture*, p. 362.

likely to happen than in the healthy conditions of that surface.

The fourth peculiarity is, *that the constitutional excitement produced by blisters is generally greater in young subjects than in the adult.* That this must necessarily be so, is obvious. In all cases, the general excitement must be in proportion to the degree of local irritation and the sensibility of the patient's system. If so, the general vascular and nervous excitement produced in the child by a blister, must, as a matter of course, be greater than in the adult. So powerful indeed is the impression thus made sometimes, that convulsions have been produced from this cause. Dr. North says: "I have frequently seen very severe paroxysms (of convulsions) brought on in consequence of their injudicious and unnecessary application."*

From the whole of the foregoing, it is evident that blisters are much more powerful in their agency upon the young subject than upon the adult. They operate with more rapidity—cause a greater degree of local irritation and constitutional excitement—and their operation is frequently followed by consequences which rarely occur in the adult.

In the use of these agents, the practical bearing of these facts should be continually borne in mind.

1. If blisters are more powerful in their action upon children than adults, then it would seem to

* Observations on the Convulsions of Infants. By John North, p. 209.

follow that they may be rendered more efficient as a means of cure in their diseases. And such appears to me to be really the fact. In all cases, where their revulsive agency is required, and where they are properly applied, it has struck me, that more decided benefit has resulted from their use in children than in adults, and that too, under circumstances as nearly similar as they well could be. Besides acting more powerfully, the rapidity of their operation in children, gives them a great advantage in many cases. We all know that one of the great objections to a blister in the adult, sometimes at least, is the length of time which it takes to produce its effects. In a child this is in a great measure obviated, and we have in a blister not merely a powerful but a comparatively speedy counter-irritant. As remedial agents therefore, in the diseases of children, it seems to me they ought to hold a high rank. I am aware, that by some, an opinion entirely the reverse of this is entertained. Mr. North, in his valuable work on the Convulsions of Infants, states that he thinks, that except as stimulants, in depressed states of the system, blisters are altogether objectionable in the diseases of children. As revulsives in cases of local inflammation, he regards them as having gained a character which they do not merit, and that in fact they do more harm than good. On this subject he says, "the period at which we apply blisters in local inflammatory affections is not to be forgotten. We first subdue the severity

of the disease by other and appropriate remedies, and when it is upon its decline, when in all probability the unassisted powers of nature would successfully perform the remainder of the task, a blister is applied. The patient gets well, notwithstanding the additional pain thus inflicted; and the fortunate result of the case, which is really to be attributed to the measures previously employed, is said to be owing to the good effects of counter-irritation, &c., and the blister gains a character, to which in point of fact it has no claim.”* Now all this may no doubt be true in some cases, but that it is so generally, can hardly be admitted. It should be recollected, that in the treatment of local inflammations, blisters are only auxiliary remedies; of themselves, and alone, capable of doing but little, and yet when co-operating with other agents, such as blood-letting, &c., exceedingly powerful and valuable. Every one knows that there are periods and conditions in the career of inflammatory complaints, when bleeding and other reducing remedies have been carried to the fullest extent deemed advisable, and yet sufficient disease may remain, if not to destroy life, yet to render convalescence tedious, or to lay the foundation of subsequent chronic disease. This of course it is all important to obviate. Now it is just under this condition of things that blisters come in with great effect, and frequently break up com-

* Observations on the Convulsions of Infants. By John North, p. 205-6.

pletely the remaining vestiges of disease ; and in this way I look upon them as remedies, acting with more power and efficiency in children even than in adults.

2. From the fact of blisters being such powerful agents, and especially from the fact of their being so liable to be followed by dangerous consequences, more caution is required in their use in children than in adults. Important and valuable as they are and may be made, if properly used, their indiscriminate application cannot be too much reprobated. Just in proportion to the good they are capable of accomplishing, under proper circumstances, is the evil which results from them, if heedlessly or injudiciously resorted to. It is to be feared that this is not always borne in mind as it should be. As a general rule, they should never be resorted to, especially in very young children, unless some decided benefit is anticipated from them.

3. The mode of conducting the process of blistering in a young subject is a matter of great nicety, and should call for the utmost care on the part of the practitioner. As one of the principal causes of gangrene, is the leaving the blister on too long, this is a point which should be specially attended to. To many this may appear a small matter, but it is really one of great moment, and in relation to which I am sorry to say that the directions given in many of our practical works are so discordant, as to be very poor, if any, guides

to the young practitioner. By way of illustration, I will quote a few of them. Dr. Armstrong says, "from twelve to sixteen hours is generally sufficient for the application of the blister in adults, and half that period in children."* Dr. Williams says, that "to avoid grangrene in children, it is advisable never to allow the blister to remain on more than six hours."† Dr. Dewees states that "in children, the blister is frequently found to have performed its duty in eight hours, and very often in six. It should therefore, always be examined at these periods, and dressed, if sufficiently drawn; if not, it should be suffered to remain until this takes place."‡ Evanson and Maunsell say, "in no instance is the blister to be left on more than a few hours (from two to four)—not longer in fact, than until the skin is reddened, when vesication will follow; but this result should not be waited for, as attendants always will do, unless the most express directions to the contrary be given."§ Neligan directs that "as a general rule, in infants and young children, blisters should only be left on until redness of the surface is produced, when the application of a warm poultice to the part will cause

* Lectures, &c. By John Armstrong, M. D., p. 362.

† Cyclopædia of Practical Medicine. American Edition. Vol. i., p. 529. Art. Counter-irritation.

‡ A Practice of Physic. By Wm. P. Dewees, M. D., p. 28.

§ A Practical Treatise on the Management and Diseases of Children. By R. T. Evanson, M. D., and H. Maunsell, M. D., p. 107.

vesication.”* Ballard and Garrod remark, that in children a blister should not be allowed to remain on longer than to produce redness of the surface; and they add, “in very young infants, it has appeared to us doubtful whether even redness should be permitted to occur before its removal.”† The foregoing is a sample of the discrepancy of opinion in relation to a most important point of practice, and one confessedly, too, not unfrequently involving the life of the young subject, as advanced by authors of the highest respectability, and who may be supposed to exert a wide influence in guiding the practice of young beginners in our profession. The fact is, and this perhaps may account somewhat for the difference of opinion just noticed, that no positive rule can be laid down in relation to the precise time that a blister should

* Medicines, their uses and mode of administration. By J. W. Neligan, M. D., p. 202.

† Elements of Materia Medica and Therapeutics. By Ed. Ballard, M. D., and A. B. Garrod, M. D., p. 457. At a meeting of the Westminster Medical Society, London, this subject was brought forward by the President, Mr. Fisher, who inquired of members what was the average time they kept on blisters. The following were the opinions expressed: “*Dr. Chowne* never employed them if he could possibly avoid it. *Mr. Snow* allowed them to remain on three or four hours, and then applied a poultice to the part. *Mr. Marson* removed them at the end of three hours, whether vesication had occurred or not. *Mr. Clarke* never allowed them to remain on children under four years of age, for more than two hours; and *Mr. Tuthill*, lately resident Surgeon of the Metropolitan Hospital for children, never saw any bad results follow their application, for spaces varying according to age, from three, four, to five hours.” *London Lancet*, 1844.

be left on a young child. From the original differences in the sensibility of the skin in children, the period must necessarily vary, and the only safe general rule, is to be governed by the actual effect produced. For this purpose the blistering plaster should be raised at suitable intervals and the state of the skin observed. And the safe plan is, according to the directions of some of the authors quoted above, to remove the blister as soon as the surface appears uniformly red, and then to apply a soft poultice. In most cases this will be followed by suitable vesication, while any injurious consequences will be averted.

It is not my intention in this paper to go into the minutiae of conducting the process of blistering, but there is one other point which I cannot help noticing, and that is, the practice which is so common with some of covering the blistering plaster with dry fly-powder. Although intended to make the blister more potent, it frequently has a directly contrary effect, from the fact that the blister does not adhere so closely to the skin; over and over again have I seen blisters prepared in this way fail in producing the desired effect, although left on even longer than the usual period. Then again, the dry powder is apt to adhere to the skin after the blister is removed, and in this way strangury is more likely to be produced. In one case, according to Ure, sphacelus has occurred from this cause.* As apothecaries are very apt

* A Practical Compendium of the Materia Medica, &c. By Alexander Ure, M. D., p. 31.

to prepare blisters in this way, it is important that practitioners should be on their guard to prevent it. With regard to the dressing of a blister, always a matter of importance to the young subject, and frequently so to the adult, I would call the attention of the reader to a mode very recently recommended by Dr. D. MacLagan, of Scotland, which holds out many advantages over the ordinary method. After leaving the blister on for a suitable time, he applies a poultice of bread and milk for two hours. After discharging the serum, a thick layer of soft cotton wadding is applied over the part, with the undressed or wooly surface next to the skin. If in the course of a few hours this should become soaked with the serous discharge from the blister, so much of the cotton may be removed as can be done without disturbing the loose epidermis beneath, and the whole again covered with a dry layer of cotton. This is all the dressing which in general is requisite. The cotton is allowed to stick to the skin of the blistered part, and when a fresh layer of epidermis is formed, which takes place very readily, the old epidermis and cotton come off together, leaving a smooth whole surface below.

The advantages of the above mode, according to Dr. M., are first, "that it renders the blister much less painful and annoying to the patient than when unguents are used. The tenderness in fact, is comparatively so trifling, and the protection by the cotton so good," he says, "that I have been

enabled without annoyance to the patient to percuss freely, and apply the stethoscope firmly over blistered parts, which had been dressed for the first time only an hour or two previously ; secondly, the blisters heal faster under it than under dressings with cerate : for although the cotton may remain adhering for some days, I have generally found, that within twelve hours the patient ceases to feel the blister a source of annoyance. Lastly, it dispenses with the greasy applications so disagreeable to patients of cleanly habits.”*

4. To obtain the good and avoid the evils of blisters, it is evident that a nicer discrimination of the conditions of the system is necessary in the use of this class of agents in children than in adults.

* Edinburgh Monthly Journal of Medical Science, May, 1847, p. 834.

Since the above was written, I find that the use of cotton as a dressing for blisters, was originally suggested by an American physician, Dr. Merrill of Natchez, Mississippi, so long ago as the year 1829. I copy the following extract from his account of it, published at the time :—“ Blisters that are not required to be kept discharging for any length of time, are readily healed by the application of finely-carded cotton, as in cases of vesication from burns. The cotton should be applied as soon as the vesicating plaster is removed, half an inch or more in thickness, and sufficiently large to ensure the complete absorption of the discharge. In two days, under ordinary circumstances, a new cuticle will be formed and the blister cured. This dressing gives no pain, and may be adopted with particular advantage in dressing blisters upon the nucha, when the patient is confined in bed, and also for persons who are not *confined* by indisposition ; as blistered surfaces, when dressed in this manner, give so little inconvenience as not to interfere with the motions of the body in common exercise.”—*North American Medical and Surgical Journal*. Vol. 7, p. 268.

Long experience has established the fact that it is only under certain states of the system, that blisters can be used with any prospect of advantage. If this be true in the adult, it is doubly so in the young subject, and any mistake in this respect is much more likely to be followed by injurious consequences in the latter than in the former. Now the conditions which influence the effects of these agents, are the state of the skin, and the state of the nervous and vascular systems. With regard to the skin, it may be laid down as a general rule, that when blisters are used as revulsives, the part to which they are applied should be as nearly as possible in a state of perfect health. In this state, the irritation of blistering may be established even in a child with comparative safety. On the contrary, when the skin is in a morbid state, ulceration and gangrene are by no means unusual occurrences. All this is occasionally illustrated in scarlatina and measles. Mr. Pereira mentions that he has seen "two instances of death from the gangrene caused by applying a blister after measles."* My friend, Prof. Dunglison, in his valuable work on *materia medica*, states that he has seen "several cases of death manifestly caused by the use of blisters in scarlatina and measles."† Other facts of a similar character might be adduced, but the preceding are sufficient to show the tendency which there exists in this state of the skin to take

* *Materia Medica*, vol. ii., p. 775. American Edition.

† Vol. ii., p. 219.

on unhealthy inflammation. And the reason is to be sought for in the changed condition of the skin. During the febrile stages of these diseases the skin is preternaturally injected and excited. As soon as the fever subsides and the eruption recedes, the skin is left in a state of debility—a state in which, as we all know, inflammation is very likely to terminate unfavorably. I hope it may not be inferred from the preceding, that I mean to express the opinion that blisters ought never to be used in such cases as measles and scarlatina—but the possible occurrence of such consequences ought to make us exceedingly cautious about the manner of using them, and indeed ought to deter us from using them at all, unless under a manifest necessity. In every case, therefore, before applying blisters to young children, the condition of the skin ought to be attended to.

With regard to the state of the system, this is even still more necessary to be inquired into. Indeed this is all important, if we hope to realize any of the expected benefits from these agents. Now there are two states of the system almost equally unpropitious to their use—and these just the reverse of each other. The first is that in which high inflammatory excitement is present. That this is unfavorable to the legitimate operation of a blister as a revulsive, is obvious, if we reflect for a moment upon the effects of this agent. These are, local irritation and general excitement. Now in all cases where an internal inflammation exists,

the difficulty of resolving it by any means will be proportioned to the degree of general excitement accompanying it. If a blister be applied where this general excitement is already very great, one of the necessary consequences will be to augment this so greatly as to counteract, in a greater or less degree, according to circumstances, the beneficial effects of the blister as a revulsive. Under this condition of things, the internal inflammation will be aggravated instead of abated, in consequence of the increase of general excitement. Hence the fact has been generally observed, that if blisters are applied in the early periods of inflammatory complaints, or before suitable evacuations have been resorted to, they frequently do more harm than good. They merely add fuel to the fire.

On the other hand, a state of great constitutional exhaustion and emaciation is also unfavorable to their operation. The reason here, however, is entirely different from that in the preceding case. The danger here is that from the impaired state of the vital energies, the local inflammation of the blister may be followed by ulceration, gangrene and death. In the use of blisters, therefore, both these extremes should be carefully avoided. With regard to the condition most propitious to their use, it is that in which the general excitement is rather below than above the natural standard. When this is the case, there is less danger from any increase of excitement, while the system is in the state most favorable to the transfer of irritations

from one part to another. Now all this is applicable to the adult, and we can easily see how much more so it must be in the case of the irritable and sensitive infant.

5. In the use of blisters in children, especial reference should be had to the peculiarities of their temperament and constitution. This is more important perhaps than it may at first sight appear. Every practitioner must have observed the extreme suffering which adults sometimes undergo from the irritation of blisters. In nervous and irritable habits I have myself seen a state of things thus induced, little short of phrenzy. In children of nervous temperaments all this is much more likely to happen, and accordingly greater caution should be exercised.

If the foregoing conclusions be founded in truth, they would seem at once to expose the impropriety of the practice of resorting to the use of blisters on every trifling occasion, in the management of the diseases of children. There is an opinion prevalent—how it has originated I know not, that blisters are innocent remedies—if they do no good, they can do no harm. Now this is unquestionably a great error, and has been productive of vast mischief. Independently of the unnecessary suffering which they may occasion, they sometimes produce death by the manifest causes of ulceration and gangrene, while in others they insidiously aggravate the disease they were intended to relieve.

SINAPISMS.

The same general precautions should be observed in the application of sinapisms as in blisters. Sinapisms are capable of producing great local irritation, as well as general excitement, and if incautiously applied, their effects are sometimes disastrous. It should never be forgotten, that the effects of these agents are greatly modified by the condition of the skin, and by the condition of the general system. This we see illustrated continually in adults. When the skin is very delicate and irritable, the application of a sinapism produces in a very few minutes extreme local irritation, as well as a general disturbance of the system. I have seen more than one patient with a skin so irritable that it had hardly been applied before it was necessary to remove it. On the other hand, some skins are so torpid, that a long time elapses before much effect is produced. Then, in certain states of disease, where the nervous system is rendered more or less insensible, they may remain for hours upon the part without any apparent effect, and yet after the patient recovers, may be followed by great local irritation and severe ulceration, which is always difficult to cure and sometimes proves fatal.

Besides all this, it is to be recollected that sinapisms differ very much in their effects, according

to the manner in which they are prepared. On this subject some interesting remarks are made by Troussseau & Pidoux. The most important circumstance however, to be recollected is, that the time they are kept on should not be regulated by any stated period, but by the effects produced. In children, especially, they should be examined continually, and removed as soon as a rubefacient effect is produced. The following highly instructive case recently occurred in France :

Death of a child by sinapisms, applied in mistake.
—Dr. Amenille mentioned, at a late meeting of the Société Médico-pratique, of Paris, the case of a little girl, six years of age, who, after an attack of eruptive fever, had swollen glands on each side of the neck. On the right side resolution soon came on, but on the left the swelling increased, and became painful; a linseed poultice was ordered, and a mustard one applied by mistake. The child screamed and complained bitterly, but was obliged to keep on the poultice for three hours; two successive sinapisms were applied after this, and the error was only discovered towards the evening. Frightful suppuration and gangrenous inflammation came on, reaching down to the sternum; the muscles, nerves, and vessels of the part were laid bare; and the child sank in spite of the most active and appropriate treatment, after having rallied a little while just before it expired. This may serve as an additional warning, even in cases where sinapisms are ordered,

and knowingly applied. Some members said that mustard poultices should not be left on children more than ten or twelve minutes. We would say not more than five or six.—*London Lancet. Boston Medical and Surgical Journal, May 22d, 1850.*

ESSAY V.

EFFECTS OF BLOODLETTING ON THE YOUNG SUBJECT.

There is no subject, perhaps, so deeply interesting to the practical physician, as the effects of bloodletting on the human system, and the various uses to which it may be applied in the management of disease. In promptness and power, it exceeds all other agents, and its capacity for doing good or harm is proportionally great. It is resorted to, also, at every period of life, and by some it is even prescribed with equal, if not more freedom in children than in adults. It becomes then, a question of the greatest moment to determine, if possible, whether the age of the patient has any influence in modifying its effects. And this is the subject upon which I propose to make a few remarks.

That the youngest child can sustain the loss of blood within certain limits, as well as the adult, is manifest from a variety of facts. Thus children are sometimes born in a state of asphyxia from apoplexy. On dividing the cord and letting a moderate quantity of blood flow, respiration is

established, and every thing does well. Again, not unfrequently, from not applying the ligature sufficiently tight around the cord, or from the cord contracting, and thus loosening the ligature, hæmorrhage takes place, and yet no injurious consequences result. Besides this, we know that in cases of disease, the youngest child may be bled, not merely without injury, but with advantage. When, however, the loss of blood is carried beyond these limits, important peculiarities are observed, showing a difference in the effects produced in the young subject, from those in the adult.

The first peculiarity is, that the young subject does not bear the loss of considerable quantities of blood, so well as the adult. I am not aware that children fall into a state of syncope from the loss of blood more readily than adults; but when syncope does come on, it is very certain that they do not recover from it so readily, and they are always in more or less danger. In the adult, syncope from the loss of blood, unless the quantity be very large, is a state which, as a general rule, is attended with little or no danger, and from which the patient speedily recovers. Hence it is that physicians are continually in the habit of inducing it in the management of certain forms of disease, and not merely with impunity, but evident advantage. In the young subject it is not so, and it is a state always attended with hazard. If the child recover from it, it does so very slowly, and every

now and then it sinks irretrievably under its influence. That this is a fact, is confirmed by abundant testimony, on the part of those who have taken the trouble to make the necessary observations. Dr. Marshall Hall, in speaking on this subject, says, "In infancy, the state of syncope (from the loss of blood) is a state of danger."* Evanson and Maunsell remark, "As a general rule, it is well to stop the flow of blood when decided pallor takes place, without waiting for actual fainting, from which children do not quickly recover."† Armstrong says, "Do not bleed to actual syncope in children, as they are apt to fall into convulsions, of which they may die. Children do not recruit from very large bleedings like adults."‡ - Dr. Ryan observes, "The abstraction of blood in cases of infants and children until fainting occurs, is the worst practice that can be imagined, as convulsions or death may be produced."§ Indeed, the general fact admits of no question; and the reason is obvious enough, if we reflect for a moment upon the nature of the agent, and at the same time compare it with the susceptibility of the subject. Carried to the point of syncope, bloodletting is one of the most direct, speedy, and profound sedatives that we have in our possession. In a few moments, it reduces the

* Researches on the Morbid and Curative Effects of the Loss of Blood. By M. Hall, M. D., p. 87.

† On the Management of Diseases of Children, p. 107.

‡ Lectures, &c., by John Armstrong, M. D., p. 387.

§ Manual of Midwifery. By M. Ryan, M. D., p. 475.

subject from a state of perfect health or the high excitement of disease, to the state of temporary death. Now, it is very evident that the capability of recovering from such a state, must be just in proportion to the powers of the constitution. From the very nature of its organization, therefore, it is obvious that the system of the child cannot sustain so well as the adult a shock so sudden and powerful as this.

The second peculiarity attending the loss of blood in the young subject, is, that the nervous system is more powerfully affected than in the adult. The evidence of this is, that convulsions and coma more frequently occur after the loss of blood in children, than in adults. In the adult, both these occurrences sometimes take place, more especially convulsions. Thus, for example, puerperal hæmorrhage is not unfrequently followed by them. I have witnessed the same thing in a gentleman of irritable habit, who had been bled too largely from the arm. He had lost about a quart of blood, when incipient syncope came on, followed immediately by a violent convulsion. In children, however, these occurrences are much more common; and the reason, no doubt, is the greater predominance, as well as impressibility of the nervous system. A great variety of causes, we know, will induce convulsions in a child, and among these, exhaustion is a very common one. With regard to coma, too, this may be brought on in children by any debilitating cause. A striking

illustration of this we see now and then in diarrhoea, which has been continued too long. In these cases, the brain becomes suddenly affected, and a state of stupor or coma is induced, which is not unfrequently mistaken for hydrocephalus. The same thing occurs from the loss of too much blood.

The third peculiarity is, that the repetition of bloodletting is not so well borne by the child as the adult. A child of good constitution and ordinary strength, may bear a first bleeding, perhaps quite as well as an adult. Under peculiar circumstances, too, of disease, a second may be borne very well. Beyond this, as a general rule, it will be found, I think, that the child cannot well sustain the loss of blood. On this point, I believe, there is little or no difference of opinion among men of judgment and observation. Dr. John Clarke observes that "Very young children bear very well the loss of blood even to fainting, once or twice, but they ill bear a more frequent repetition of bleeding. Their powers sink under it, and by no art can it be replaced."* Marshall Hall says, "In infancy a second or a third bloodletting is borne with difficulty."† Evanson and Maunsell say, "Repetitions of bloodletting are not well borne by the child."‡

The fourth peculiarity is, that the effects of local bloodletting, especially leeching, are different upon the

* Commentaries on the Diseases of Children, p. 103.

† Researches on the Loss of Blood, p. 87.

‡ On the Diseases of Children, p. 108.

child, from what they are upon the adult. In the adult, the effect of leeching is in a great measure local, and it is not usually resorted to until after general bloodletting is considered inadmissible. In a child, on the contrary, it produces very much the same effect as a general bleeding. From the greater vascularity of the skin, too, the amount of blood lost by a leech, applied to a young subject, is much greater than in the adult, and it is frequently much more difficult to arrest the hæmorrhage from it. The general effect, then, of leeching, on the young subject, is much greater than upon the adult. Hence it is that cases are so frequently occurring, in which children die from leeching. Of this we have numerous cases on record. Dr. Christison says, "I have twice known children bleed to death in hospital practice, the nurse having labored under a common prejudice among their craft, that leech-bites cannot bleed too much."* Pereira states, that "in two cases of infants, I have seen exhaustion with insufficient reaction, consequent on hæmorrhage after a leech-bite, terminate fatally."† Ryan says, "The loss of blood from a single leech-bite has caused the death of a child."‡

From the foregoing, then, it would seem, that although a child may sustain the loss of certain quantities of blood, perhaps quite as well as the

* Dispensatory, p. 492.

† Materia Medica, vol. ii., p. 769.

‡ Manual of Midwifery, p. 475.

adult, when carried beyond this, they do not bear it so well, nor do they bear the repeated and continued loss of blood so well; and under these circumstances, dangerous and even fatal consequences are apt to ensue. In other words, blood-letting is an agent which operates with more power, and is attended with more danger in the child than in the adult.

If all this be so, the following deductions necessarily follow.

1. Great caution should be exercised in bleeding children to the point of syncope. If the state of syncope be attended with the danger already alluded to, it is very certain that nothing can justify us in producing it, unless it be determined that it is essential to the management and cure of the case. Now, that in most cases, even of decided inflammation, it is not necessary to carry blood-letting to this extent, is very certain. We know that it is not so in the adult, and it evidently cannot be so in the child. As a general rule, therefore, it cannot be required. By some high authorities, however, it is supposed that under certain conditions of diseased action, the safety of the patient depends upon the production of syncope. Thus, for example, in croup, bleeding *ad deliquium* has been insisted upon by the late Dr. Bayley of New York,* Dr. Dick of Alexandria,† and Dr. Ferriar of Manchester. The latter

* New York Medical Repository, vol. xii., p. 381.

† Barton's Med. and Phys. Jour., vol. ii.

especially speaks of it, as "the essential point of the cure, without which no relief can be effected."* If in any disease the practice be justifiable, it certainly is in this, and it cannot be denied, that in a great number of instances, it has been resorted to with safety. Notwithstanding this, general experience has abundantly established the fact, that even here it is not necessary, and that all the beneficially sedative effects of the remedy may be obtained, without going to this extent. On this point, there appears to be, at the present time, a pretty general concurrence of opinion among enlightened practitioners, and the rule of practice ought to be, *never* in any case to bleed to syncope, but to stop as soon as paleness of the lips and cheeks come on. In this way, all the good of bloodletting is secured, while the risks of syncope are avoided.†

2. To determine the precise amount of blood proper to be drawn, is a matter of much greater nicety, and involves more serious consequences in the child, than in the adult. In the adult, the loss of a little more blood than is necessary, as a general rule, is a matter of no very great consequence. In the child, on the contrary, it may prove fatal. In the adult, too, we have means of judging how far it ought to be carried, which we have not in the child. Thus, for example, the pulse, which in

* Medical Histories and Reflections, by John Ferriar, M. D., p. 371. American Edition.

† Appendix.

the adult is so valuable a guide in these cases, cannot be depended upon at all in the child. It is always, therefore, a very nice and difficult problem in practical medicine, how to adjust properly in a child the amount of blood necessary to be drawn, to the exact wants of the case. Now there are only two ways in which this can be done. The first is, by fixing upon a certain amount as suitable to different ages. The second is, to judge by the actual effects produced at the time of taking the blood. With regard to the first of these modes, it is evident that it must be a very unsatisfactory guide, if we recollect that no two constitutions are precisely alike, and that there is every difference in the capacity of different systems, even in the same disease, to bear the loss of blood. Then, again, the same disease exists in different degrees of violence, and of course requires a modification in the amount of depletion. Besides all this, different diseases do not require and cannot tolerate the same loss of blood. A general standard, then, founded upon the age of the patient, is really good for nothing, except as a mere approximation. In individual cases, it must be inapplicable. Hence it is, that all those standards laid down by authors, differ so much from one another, and must necessarily do so. If blood be taken by *leeches*, the difficulty is still further increased, from the circumstance that the desired quantity can hardly ever be obtained with any degree of precision : if it is so, it is purely by

accident. That this must be so is evident, if we recollect the variable quantities of blood drawn by the leeches themselves, and more especially the greater differences in the after-bleedings. It is not yet settled, I believe, exactly how much blood a leech will draw. Christison says, "Twice as much blood may be usually drawn by fomentations, as by the suction of the leech. A single leech, when applied successfully, may thus be held to draw, from first to last, *about half an ounce of blood on an average.*"* According to Evanson and Maunsell, "the quantity of blood obtained by a good leech, allowed to bleed for half an hour, may be estimated *at one ounce.*"† Pereira says, "I believe *four drachms* to be the maximum. On an average, I do not think we ought to estimate it at more than *a drachm and a half;*"‡ i. e., the quantity taken by the leech itself, without reference to the after-bleeding. Now the fact is, it is impossible to specify the amount of blood drawn, either by the leech itself or in consequence of the subsequent bleedings. Leeches differ in their size very greatly, and there must, of course, be a great difference in the quantity of blood they are capable of taking. Then, again, there is every difference in the after-bleedings, depending on the vascularity of the skin, the part of the body to which they are applied, and various other circumstances.

* Dispensatory, p. 492.

† Practical Treatise on Children, &c., p. 106.

‡ Materia Medica, vol. ii., p. 769.

From all this, it is evident how unsafe it must be to draw blood from a child, according to any average standard.

With regard to the second mode, that of judging of the extent to which it should be carried by the effects produced at the time: in many cases this answers exceedingly well. In inflammatory complaints, where the full effect of the loss of blood may be necessary, the rule can be satisfactorily applied, and the best plan is to bleed in the erect posture, until pallor of the face comes on, without producing actual syncope. In the adult, according to Marshall Hall, the production of actual syncope constitutes the criterion as to the exact amount which the case requires, as well as of the capacity of the system to bear the loss of blood, and therefore he recommends this as the rule for the due administration of the remedy. Now, that this will not answer, must be obvious to every one. Every practitioner knows that cases are continually occurring, in which actual syncope comes on after the loss of a few ounces of blood, when large quantities are afterwards required to be drawn. In children, of course, the rule cannot be applicable. In them, the loss of so much blood as to bring on only approaching syncope, might not only be unnecessary, but be attended with danger. From all this, then, it would appear that we are not in possession of any precise mode of determining how much blood ought in all cases to be taken in children; and

this shows the necessity of great caution and the exercise of sound judgment, in the use of the remedy.

3. From the uncertainty in estimating the quantity of blood lost by leeches, and the dangers attending the loss of too much from them in children, too great caution cannot be exercised in their use. From the manner in which leeches are ordered by some physicians, in the diseases of children, one would be led to suppose that no harm could ever result from them. From the ease, too, with which they may be prescribed, and the appearance of energy which it gives to the practitioner, it is to be feared that not unfrequently they are used without being actually necessary, and even when necessary, they are suffered to draw blood without sufficient regard to the quantity which may be lost. Now it should always be recollected, as already stated, that leeches operate differently on the child from what they do on the adult. In the latter, they are in a great measure local in their action, and may be, and generally are used, when general bleeding is contra-indicated. In the child, on the contrary, they act in the same way as general bleeding. Their sedative effects, therefore, upon the constitution of the child, are much greater; and if suffered to bleed beyond a certain limit, they endanger life. On these accounts, it is more necessary to be cautious in the use of them in children, than in adults. It is not my intention to go into any particulars, in

relation to the mode of conducting the process of leeching. There are a few points, however, of a practical character, connected with this subject, which may not be unworthy of notice. 1. When leeches are applied to a child, the patient should always be placed in the erect posture. The same rule indeed should be observed, in whatever way blood is drawn. If it be a fact that leeches act like general bloodletting upon the child, the propriety of this rule must be obvious; and it is the more necessary to insist upon it, because it is hardly ever observed. As soon as any paleness of the lips or face appears, the child should be placed in the recumbent posture, and the bleeding arrested.* 2. When leeches are applied to a child,

* For the purpose of doing this, I know of nothing so good as the *Matico*. This does it promptly, effectually, and with almost uniform success. The leaf is simply to be applied to the leech bite, and pressed upon it with the finger for a short time, and the bleeding is arrested. Whoever has encountered the embarrassment frequently attending the stopping of the bleeding of leech bites, by the mode in ordinary use, cannot but appreciate the value of the *Matico*. Not merely in this case, but in many other cases of hæmorrhage, it is a most precious addition to our list of astringents.—In *Epistaxis* I have found it an admirable remedy—doing what no other article can do. I recently had recourse to it in the case of a gentleman, who had had, at intervals of about a year, two attacks of this affection. Each time the bleeding was so free—uncontrollable by all the ordinary applications—that his strength became so greatly reduced, that it was found necessary to resort to the unpleasant operation of having both anterior and posterior nares plugged up by the surgeon. Recently he had a third attack of a similar character; by freely snuffing up the *matico* in powder, the bleeding was immediately arrested, and without any return. For the first introduction of this most valuable addition to our materia medica, the profession is indebted to Dr. Jeffries of Liverpool.

the patient should never be left until after the flow of blood is completely stopped. 3. Leeches should never be applied at bed-time, and suffered to bleed during the night. In this way, the patient has, in more cases than one, bled to death. If applied late at night, they should be watched just as in the day time. 4. As a general rule, leeches should not be applied to soft parts destitute of support from underneath, in consequence of the difficulty of making pressure sufficient to arrest the hæmorrhage. The importance of this was first noticed by Dr. Cheyne, who advises them to be applied in croup, not to the neck itself, but over the clavicle, sternum or ribs.* 5. Leeches sometimes open into arteries, and dangerous hæmorrhage has ensued from this cause. A case of this kind happened, in which the temporal artery was thus opened, and Sir Astley Cooper was obliged to divide the artery before the hæmorrhage could be arrested.† In all cases, therefore, the progress of the bleeding should be carefully watched.‡

* Pathology of the Larynx and Bronchia, by John Cheyne, M. D., p. 57.

† Johnson's Med. Chir. Rev., vol. ix., p. 71.

‡ Dr. Churchill lays down another important rule in relation to leeching. It is this,—“*that in all cases where they are applied to infants or children, the bleeding should be arrested at once when they fall off.* By so doing we can estimate exactly the amount of blood lost, and we avoid the great mischief of continued draining. Of course it will be necessary to apply a greater number of leeches than usual, or to repeat them; but that is of no consequence, compared with the danger of the ordinary method. Each leech will abstract from one to two

4. If bloodletting be so profound a sedative to children, it is evident that it is capable of doing a vast deal of harm in cases unsuited to its use, and that it requires a very nice discrimination of the character of the case, before it can be used with safety. This may appear very commonplace;

drachms of blood, and the number must be proportioned to the amount we wish to take away.”—*On the Diseases of Infants and Children*. By F. Churchill, M. D., p. 92-3.

In relation to this the editors of the British and Foreign Medico-Chirurgical Review, make the following remarks:—“While we agree with the main principle here inculcated, and always enforce it in private practice, yet we are constrained to acknowledge, that sometimes in public practice we are obliged to act differently. This arises from the fact, that those who have to *pay* for the leeches, will not, and often cannot, admit the full force of Dr. Churchill’s statement. If the author, like ourselves, has ever belonged to a public charity, deficient in funds, and regarding the expense of leeches with no favorable eye, or has largely attended the poorer classes under circumstances when they had themselves to purchase the leeches, we think he will pardon us when we confess that occasionally we have ordered half the number otherwise advisable, and directed the “draining” to be allowed to continue for a short time after their removal from the part. The clumsiness and the impatience of the mother, and the uncleanness of the child, will frequently prevent some of those we do order, from biting; and hence only half the business would be effected in some cases, were no draining to be allowed. True, it would be better that the mother should return to the charity for more leeches, or buy them herself; but where is the charity that fully recognizes such a rule, or where is the poor mother that can or would so readily purchase them? The practice we are too often forced to adopt, is, we admit, bad in its principles; but we often feel that the exigencies of the case compel it. We always urge upon the nurse not to put the child back into a warm bed immediately after leeching; or, if such is necessitated, to watch it carefully.”—*British and Foreign Med. Chir. Review*, July, 1850, p. 145-6.

but, commonplace as it is, it is to be feared that it is not sufficiently borne in mind in actual practice. The presence of inflammation or congestion is generally considered a condition justifying and requiring a resort to bloodletting, and so indeed, as a general rule, it is: but it is not so universally. Thus, for example, the inflammation attending scarlatina does not usually require or bear well the loss of blood; and there can be no question that, in this complaint, many a child has been sacrificed by a resort to this remedy. Then, again, symptoms analogous to those produced by inflammation or congestion result from a cause directly the opposite, viz., irritation or mere exhaustion. Illustrations of this we see frequently in affections of the head in children, convulsions, &c. In these cases, if the cause of the difficulty be mistaken and depletion be resorted to, the result may be fatal. All this shows that, before bloodletting is used in children, the nature of the case should be investigated more nicely even than in the adult.

5. In the use of bloodletting in the young subject, especial regard should be had to their constitutions, as well as their mode of living. No principle is better understood, or ought to be so, even in adults, than that in the use of debilitating remedies, due regard should be had to the powers of the system. No practice is safe which does not take into consideration the relative capacity of the system to bear them; otherwise the remedies may be more fatal than the disease for which they are

prescribed. Now we know that in the adult there is every difference in this respect. In the management of the same disease accordingly in different individuals, a very different course of treatment is necessary, if not in the remedies themselves, at least in the extent to which they are carried. In the young subject this is still more necessary. Children whose constitutions are naturally feeble and vicious, or who have been enfeebled by debilitating causes, such as poor diet, confined air, &c., sink very readily under the influence of depressing remedies. In these, bloodletting is badly borne, and should never be resorted to unless absolutely necessary, and then in moderate quantities.

6. Great caution should be exercised in the repetition of bloodletting. After what has been already said in relation to the effects of repeated bloodletting on the young subject, I should not again allude to it, were it not to notice the opinions of an eminent authority. Dr. Rush, in his "Defence of Bloodletting," makes the following statement: "I could mention many more instances in which bloodletting has snatched from the grave children under three or four months old, by being used three to five times in the ordinary course of their acute diseases."* That the children alluded to by Dr. Rush survived this treatment, I do not doubt; but that these repeated

* Med. Obs. and Inqs. Vol. iv., p. 300.

bleedings were necessary, I can hardly believe. At any rate, a practice like this, if generally adopted, would, in my humble opinion, end in the most disastrous results.

In concluding this paper, I trust it may not be thought that I am opposed to the use of blood-letting in the diseases of children. The physician who discards this agent, understands but poorly his profession or the duty which he owes his patients. The proper use of a remedy, however, is one thing, the abuse of it is another; and I must express the opinion, founded on no small observation, that it is frequently resorted to in children when it is unnecessary—when necessary, it is often carried too far—and that in its general use, there is frequently an absence of precision and care, which in many cases renders it a most dangerous remedy. With regard to the use of blood-letting generally in this country, there can be no doubt that the authority of Dr. Rush has exerted an influence the most deleterious. That it should have done so, is not surprising. Living at a time when medicine was yet in its infancy among us—at the head of the oldest and most influential of our medical schools, and attracting, by his enthusiasm and his eloquence, a large proportion of the students of the country, his sway for a series of years was unlimited, and his sanguinary precepts, and his still more sanguinary practice,* were

* To justify the language used above, and which may be considered too strong by some, let me make a quotation or two

speedily diffused from one end of the country to the other. Although sad experience has long since exposed the fallacy, as well as danger of his doctrines, yet many of the evil consequences of them are still to be met with; and not the least of these, it appears to me, is the opportunity which they have, indirectly at least, afforded for the prevalence of quackery. It is a part of our nature to fly from one extreme to another. When an error is once exposed, we are apt to go immediately to its opposite, inferring that what is the reverse of wrong must necessarily be right; and so it has been in regard to bloodletting. The public having been made acquainted with the evils of the practice of Dr. Rush, a prejudice, if not general, at least very extensive, has been

from Dr. Rush's celebrated "Defence of Bloodletting." "Bleeding should be continued while the symptoms which first indicated it continue, should it be until four-fifths of the blood contained in the body are drawn away." *Med. Obs. & Inq.* vol. 4, p. 353. The amount of blood in an adult is estimated at about 32 lbs. Four-fifths is over 24 lbs.!

Again, in enumerating the advantages of bloodletting, he says: "In cases where bleeding does not cure, it may be used with advantage as a *palliative* remedy. Many diseases induce death in a full and highly excited state of the system. Here opium does harm, while bleeding affords certain relief. It belongs to this remedy, in such cases, to save pain, to relieve convulsions, to compose the mind, to protract the use of reason, to induce sleep, and thus to smooth the passage out of life." *Med. Obs. and Inq.*, vol. 4, p. 357. In other words, if I understand him, one of the advantages of bleeding is, that it makes persons die easily! This reminds me of a melancholy case which I once witnessed. A young gentleman, about eighteen years of age, had been suffering about three months under organic disease of the brain. During this period he had been

created against the remedy itself, and empirics, always ready to play upon the weaknesses and prejudices of the community, have seized upon it for the mere purposes of traffic. Accordingly, the land is now filled with a set of men who pretend to practice medicine, without resorting not merely to bloodletting, but many of the other remedies sanctioned by long and tried experience. And what is melancholy, but true, they find a ready sympathy in a large portion of the community. Whether I am too severe in attributing the popular empiricism of the day to the influence of Dr. Rush, must be left to the judgment of the profession. One thing, however, is very certain, and which we see illustrated every day. Whenever a person has been overtaxed with active medicine,

subjected to every kind of treatment. Bloodletting, emetics, cathartics, mercurials, tonics, &c., had all been used in succession, but without arresting at all the progress of the disease, and he had now become stone blind, was paralytic, and reduced to the extremest state of emaciation and debility. In short, he was barely kept alive by the use of stimulants. In this state of things a friendly doctor happened to drop in, and expressed the opinion that the disease was inflammation of the brain, and that a good bleeding would relieve him. Notwithstanding the urgent remonstrances of the attending physician, that the result would be almost immediate death, the idea took with his friends, and he was bled by the doctor who suggested the practice. As might have been expected, in about six hours he was a corpse, and the great consolation to his friends seemed to be that he died so easily! Verily, on becoming acquainted with such practice, one would be tempted to believe that the Emperor Nero must have been a very tender-hearted man in condemning Seneca to so pleasant a mode of terminating his existence as bleeding to death. For the particulars, see the *Annals of Tacitus*, Book 15, sec. 60.

he is apt to discard all belief in medicine generally, and he is then ready to fall into any absurdity. It is with medicine as it is with religion. Superstition once thrown off, infidelity follows, and the result in both cases is the same. Calm reflection and rational inquiry are out of the question, and boasted independence speedily becomes the easy prey of the knave and the empiric.

ESSAY VI.

OBSERVATIONS ON ERGOT.

In the whole range of the materia medica there is no article more interesting in its effects on the human system than ergot. Given during labor, it possesses the curious property (possessed by no other substance that we know of,) of exciting uterine action, and facilitating, in a most extraordinary manner, the whole process of delivery. Upwards of forty years have now elapsed since its introduction into general practice in this country;* and during portions of the same period it

* Although used previously by the common people, ergot was first introduced into regular practice in 1807, by the late venerable Dr. John Stearns, of this city, at that time residing in Saratoga county, State of New York. As every thing connected with the use of this article is interesting, I shall give the brief letter of Dr. Stearns in relation to it, addressed to Dr. S. Akerly of New York, dated Jan. 25, 1807.

“In compliance with your request, I herewith transmit you a sample of the *pulvis parturiens*, which I have been in the habit of using for several years with the most complete success. It expedites lingering parturition, and saves to the accoucher a considerable portion of time without producing any bad effects on the patient. The cases in which I have generally found this powder to be useful, are when the pains are lingering, have wholly subsided, or are in any way incompetent to exclude the fœtus. Previous to its exhibition it

has been extensively used in Great Britain and on the continent of Europe. After such ample experience, we should naturally suppose that every thing in relation to its action would be completely established. Such, however, is not the case.

is of the utmost consequence to ascertain the presentation, and whether any preternatural obstruction prevents the delivery; as the violent and almost incessant action which it induces in the uterus precludes the possibility of *turning*. The pains induced by it are peculiarly *forcing*; though not accompanied with that distress and agony of which the patients frequently complain when the action is much less. My method of administering it is either in decoction or powder. Boil half a drachm of the powder in half a pint of water, and give one-third every twenty minutes till the pains commence. In powder I give from five to ten grains; some patients require large doses, though I have generally found these sufficient.

“If the dose is large it will produce nausea and vomiting. In most cases you will be surprised with the suddenness of its operation; it is therefore necessary to be completely ready before you give the medicine, as the urgency of the pains will allow you but a short time afterwards. Since I have adopted the use of this powder I have seldom found a case that detained me more than three hours. Other physicians who have administered it, concur with me in the success of its operations.

“The *modus operandi* I feel incompetent to explain. At the same time that it augments the action of the uterus, it appears to relax the rigidity of the contracted muscular fibres. May it not produce the beneficial effects of bleeding without inducing that extreme debility which is always consequent upon copious depletion? This appears to be corroborated by its nauseating effects on the stomach, and the known sympathy between this viscus and the uterus.

“It is a vegetable and appears to be a spurious growth of rye. On examining a granary where rye is stored, you will be able to procure a sufficient quantity from among that grain. Rye which grows in low, wet ground, yields it in greatest abundance. I have no objections to your giving this any publicity you may think proper.”—*New York Medical Repository*. Edited by Samuel L. Mitchell, M. D., and Edward Miller, M. D., vol. ii., p. 308.

Several important points are still under dispute, and it is upon these that it is proposed to make a few observations in the following paper.

1. By some it is *denied that ergot possesses any such property as is generally ascribed to it*. On this point it would seem hardly necessary to say any thing. Whether ergot does or does not possess such property, is a question which must be decided by the observations and testimony of those who have used it, and the mass of recorded as well as unrecorded evidence which we possess on this subject, is so abundant, as one would suppose, would be sufficient to preclude all doubt.* Notwithstanding all this, it is maintained by some high authorities that ergot does not act upon the uterus, and in support of this opinion it is alleged that it has been frequently given without any such effect having followed; and when it has taken place, it is explained upon the ground of its being a mere accidental coincidence, and that the uterine efforts would have been renewed just as certainly

* Bayle has collected the reports of sixty-two authorities on the subject of ergot, and out of 1176 cases of lingering labor in which it was used, 1051 were more or less promptly terminated by it. In 111 cases, it failed to produce any effect, and in 14 the success was moderate.—*Bibliothèque Therapeutique, &c., par A. L. I. Bayle, tome iii., p. 534.*

In addition to the foregoing mass of authority, I will only adduce the testimony of Dr. Ward, of New Jersey, who states that during six years, he gave it to between sixty and seventy patients, and in every case, except one, it produced powerful uterine contractions in fifteen or twenty minutes after its administration.—*New York Med. and Phys. Jour. for 1825, vol. iv., 212.*

without its agency. Now that ergot has frequently been given without producing any effect on the uterus is readily admitted, and yet this by no means proves that it is destitute of the power ascribed to it. Some constitutions are doubtless not susceptible to its action. This we know to be the case with many agents, whose action on the human system is universally acknowledged. Besides, much of the alleged inefficacy of ergot may very readily be explained by the fact, now well known, that this article is not always precisely the same. From a variety of causes influencing the growth of this curious substance, independently of designed sophistications, it has been established that its properties differ very materially, and if these be not duly regarded, it is by no means wonderful that its use is frequently not followed by any effect. With regard to the supposition that the uterine action which follows its exhibition is a mere coincidence, it seems to me to be entirely done away with by the fact that the pains which are produced are entirely different in their character from those of ordinary labor. The latter are distinguished by perfect intermissions; while the former are not only more severe, but they are continuous until the labor is completed. Females themselves are perfectly conscious of this difference in the two kinds of pain, and by them this difference has been frequently described. Besides this, the uniformity and rapidity with which the pains come on after the exhibition of ergot, is alto-

gether irreconcilable with the supposition of its being a mere coincidence. If the pains came on at remote and variable periods, then indeed might there be some ground for denying the agency of the ergot in producing them. This, however, is not the case. As a general rule, in from five to twenty minutes severe and forcing pains come on,* and after continuing for an hour or more, if the delivery be not completed, the same effects may be reproduced by a repetition of the dose. Now, if all this does not prove that the ergot is the cause of the uterine action, I am at a loss to conceive what kind of evidence will establish the action of any medicinal agent on the human system. If we still doubt in relation to ergot, we may with equal propriety doubt concerning the operation of ipecacuanha on the stomach, or of

* By Dr. Prescott the time was precisely marked in twenty cases. "In two of these, the increased strength of the pains and the continued action commenced in seven minutes from the time the decoction was taken; in one case, it was eight minutes; in seven, it was ten; in three, eleven; and in three others, it was fifteen minutes; in the four remaining cases, there was no apparent operation until twenty minutes had expired."—*A Dissertation on Ergot, by Oliver Prescott, A. M., p. 11, Boston, 1813.*

Dr. Ward, as already quoted, states that he used it in sixty or seventy cases, and in all excepting one case it produced "powerful uterine contraction in fifteen or twenty minutes after its administration."—*New York Med. and Phys. Journal, vol. ii., p. 212.*

Mr. John Paterson, of Aberdeen, states that he used it in eight cases, and it acted strongly in all, in less than five minutes after it was administered.—*Edin. Med. and Surgical Journal for Jan., 1840, p. 142.*

calomel on the liver. Although there can therefore be no reasonable question about the operation of ergot, yet it is certain that it sometimes fails. This is a fact which has been frequently noticed by those who have prescribed it. Professor Dewees states that he has "in several instances failed to produce the slightest effect with the ergot procured at one shop, whilst that from another, in the same patient, has been as prompt as it was efficacious."* The same thing has been observed by others. In a large majority of cases this can easily be accounted for. The character of this article is modified by a number of circumstances, all of which should be attended to if we wish to have it genuine. As these are important in a practical point of view, they are deserving of attention.

In the first place, the character of the season, as to dryness or moisture, appears to influence very materially the quality of the ergot. According to Burnett, it has been ascertained that the principle of the ergot resides in the diffuent peridium or external covering. Now if heavy rains fall at the time when the peridium is soft and moist, it will be washed away and the hardened nucleus, if wholly denuded, will be utterly inert. If the weather be fine during the maturation of the fungus, the diffuent peridium will be dried upon the spur, and the ergot be in its most active state.

* *American Journal of Medical Science*, vol. i., p. 255.

Hence it is, that although moisture favors the early growth of the ergot in the spring and summer, it requires a dry autumn to ensure its activity.*

In the second place, the period when it is gathered has an influence on the character of the ergot. According to the experiments of Dr. Kluge of Mendelurtz, it would seem that it only displays its active properties, when collected before the cutting of the parent crop. At the Maternité of Mendelurtz, trials were made upon fifteen females, and the result was, that what was gathered before harvest was very energetic, while that collected after harvest was altogether powerless.† Whether this be true in its full extent or not, certain it is that there is a great difference in the strength of the article according to the time when it is gathered.

In the third place, the time it has been kept modifies the quality of the ergot. Although some experiments of Lorinser would seem to show that so far as its action on the stomach is concerned, it retains its active properties for two years,‡ yet the result of general observation has shown that its influence over the uterus is impaired if it be kept

* Outlines of Botany, by Gilbert Burnett, Prof. of Botany in King's College, London, p. 207. Upon the same principle he explains the fact, that the grain in which the spur prevails in equal proportions, will in some years produce the dry gangrene, while in others it will not.

† American Journal of Medical Sciences, vol. xii., p. 515.

‡ Edinburgh Med. and Surg. Journal for 1826, p. 453.

over the year in which it is collected. Like all other vegetables too, it is easily acted on by heat and moisture. To have it good, therefore, it should be fresh; and it ought to be kept in bottles tightly stopped, and it should not be pulverized until required for use.*

In the fourth place, a fictitious ergot has sometimes been sold for the real article. In this country and on the continent of Europe, where rye is extensively cultivated, and where of course there is an abundance of ergot, this is a fraud which is not likely to be met with. In England, however, where much less rye is grown, the ergot is occasionally very scarce, and this has led to a variety of impositions. Dr. O'Shaughnessy of London states, that a specimen of suspected ergot was once given him for analysis, and he found it to be composed of the sulphate of lime, which had been cast

* In a recent number of the *Journal de Chimie Medicale*, the following method for preserving ergot in a good condition for several years, is recommended by M. Victor Legrip :

1. Reduce the recent ergot well dried into powder.
2. Expose the powder to a temperature of 45 or 50 degrees centigrade, (i. e. 104 or 122 Far.) in order to dry it thoroughly and quickly.
3. Put it into glass bottles and seal hermetically.
4. Withdraw it from the action of light by shutting it up either in a dark place or by covering the bottles with black paper.—See *London and Edinburgh Monthly Journal of Medical Science*, No. 52, April, 1845.

According to Mr. Wright, the best ergot is dry, and easily broken, purplish-black on the surface, pale-grayish in its substance, lighter than water, free of insects, inflammable and burning with a clear flame, and incapable of forming a dark-blue pulp when its powder is triturated with iodine and water.

in a mould and colored, so as to imitate very closely the natural ergot.* Mr. Wright says he has several times observed the ergot to be adulterated with common paste; "a fraud," he suspects, "of very frequent occurrence, though not of very easy detection; for the process of baking generally modifies the starch, so that it can scarcely be indicated by iodine."†

The foregoing causes appear to me abundantly sufficient to account for the discrepancies in the statements which have appeared in relation to the action of this singular substance, as well as for the occasional failure which attends its use.

2. *Acting thus powerfully on the uterus, does ergot produce any effect upon the child?* This is a question of great interest, and one which involves consequences of great importance, not merely in a professional, but in a moral point of view. On this subject, the opinion of the profession is divided. While some maintain that it produces no effect, at least no injurious effect upon the child, others contend that it frequently proves destructive of life, and that the general use of it is one of the causes of the great increase in the number of still-born children. An attentive examination of the subject, in all its bearings, will, I fear, but too certainly lead to a conclusion in favor of the latter opinion. From the peculiar effect of the ergot upon the uterus, it is evident that the child must

* Lancet for 1830-31, vol. i., p. 638.

† Edinburgh Med. and Surg. Journal, Oct. 1839, p. 297

sustain a degree of pressure entirely different from what it does in ordinary labor. In the first place, it is much greater. In the second place, it is unremitting and continued, and that too for a considerable length of time. Now, it is by no means unreasonable to suppose that this pressure may frequently prove injurious and even fatal to the child. This would be more especially likely to happen in cases where the waters are discharged early, and where the uterus is contracting directly upon the child. In natural labor, the child has time to recover from the effects of pressure during the intervals between the pains, while here no such chance is afforded. And it is not irrational to suppose that the design in making the pains of labor intermitting, was not merely to allow the mother time to recover her strength, but also to enable the child to recover from the effects of pressure. That continued pressure may and does prove injurious to the child even in cases of ordinary labor, where this process is protracted, either from the disproportionate size of the child, or from the resistance of the parts through which it is to pass, is a fact well known. How much more likely is this to happen where an unnatural and unremitting pressure is kept up, as is the case under the influence of ergot? From these general considerations it would seem not merely perfectly natural, but unavoidable, that in many cases, the child must suffer from the use of ergot. After all, however, this is a question which must be de-

cided by facts, and these will tend still further to countenance this opinion. So early as the year 1812, it was suggested by the editors of the New England Journal of Medicine and Surgery, that while fully convinced of the parturient powers of the ergot, they were apprehensive that an evil of great magnitude not unfrequently resulted from its use; and that was the death of the child. They stated that they had been led to this apprehension from "observing that in a large proportion of cases where the ergot was employed, the children did not respire for an unusual length of time after the birth, and in several cases the children were irrecoverably dead."* Since then a large amount of testimony has been furnished confirmatory of the truth of this suggestion. In the same Journal,† a case is recorded of a female in her third labor, who was delivered of twins. After the first child was born, which was living, an hour elapsed without the recurrence of a single pain, in consequence of which it was determined to administer the ergot. Fifteen grains in powder were accordingly given in a little water. In fifteen or twenty minutes the pains came on and continued without remission until the child was born, which was in about twenty minutes from the time the pains commenced, the head being born first, as in natural labor. The child, however, was

* Vol. i., p. 70.

† Vol. ii., p. 353.

still-born, and every effort to resuscitate it failed. It was in every respect as fine a child as the first, perfectly fresh and firm. The writer remarks that "every one who is acquainted with the facility with which in a case of twins, the second child makes its way into the world, will consider the death of the child in this instance as an unusual occurrence."

Dr. Ward of New Jersey, whose experience with this article appears to have been extensive, and who speaks of it as a valuable agent in many cases, nevertheless admits the danger which attends the child from its use. "In all the cases," he says, "in which I have given it, unless the child was expelled very soon after the powerful contractions came on, it suffered very much, and would lie for some time without breathing." Again he says, "from my own observation, with regard to the ergot, as well as from other correct sources of information, I am led to conclude that in most cases, after giving it, unless the child is expelled in forty minutes after the powerful contractions come on, it will be born dead."*

The late Dr. William Moore, a veteran practitioner of obstetrics in this city, after detailing some cases, gives his opinion in relation to ergot in the following terms: "It appears to be injurious to the child at all times; for in every case in which I have seen it exhibited, the child has been

* New York Med. and Phys. Journal, vol. iv., p. 212.

still-born, and in the greater part of them it was not possible to restore it to life.”*

Dr. Hosack states that he gave the ergot in three cases, and “although no evidence existed previous to the use of the medicine, that the foetus was not living, in every case it which it was administered, the child was still-born.”†

Dr. Chatard, of Baltimore, made two reports in relation to the effects of ergot. In the first, out of twelve cases in which it was given, six of the children were still-born.‡ In a second report, out of twenty-five cases, eight were still-born, two of whom were, however, resuscitated.§

Dr. Holcombe, of New Jersey, says, “more children, I am satisfied from what I have seen and heard, have already perished by the injudicious use of ergot, during the few years which have followed its introduction into the practice of this country, than have been sacrificed by the unwarrantable use of the crotchet for a century past.”||

Dr. Church, in seven cases, which he details, in which the ergot was used, had five children still-born. Although he thinks that in these cases the ergot had nothing to do with this result, yet he confesses that he “has no doubt if given in cases

* Compendium of Midwifery, by Samuel Bard, M. D., p. 214, 4th edition.

† New York Med. and Phys. Journal, vol. i., p. 205.

‡ New York Medical Repository, vol. xx., p. 17.

§ Ibid., vol. xxi., p. 160.

|| Philadelphia Journal of the Med. and Phys. Sciences, vol. xi., p. 318.

where there is a great rigidity of muscular fibre, before the labor is advanced, when the os uteri is undilated, the external parts unrelaxed, and when bloodletting has not been premised, that the powerful and continued efforts of the uterus, caused by the ergot, will prevent the retreat of the child's head after it has advanced within the bones, and that the unceasing pressure may in some instances occasion death."*

Dr. Davies, of London, reports ten cases in which the ergot was used. In four, the child was still-born. In a fifth, the child was apparently still-born, but soon recovered. In all the still-born cases, it appears that the child was not delivered until upwards of an hour had elapsed after the administration of the ergot. In the first, two hours elapsed; in the second, a little more than an hour; in the third, six hours; in the fourth, a little over an hour.†

Mr. T. Chavasse, of Birmingham, states that "in eighteen cases in which the ergot was used, the children were still-born."‡

Mr. Jukes, of Birmingham, says that "out of six cases in which he used it, five of the children were still-born."§

* Philadelphia Journal of Med. and Phys. Sciences, vol. viii., p. 139.

† New England Journal of Med. and Surgery, vol. xv., p. 18.

‡ Transactions of the Provincial Med. and Surg. Association, vol. iv., copied into the Transactions of the New York State Med. Society, vol. iii., p. 353.

§ Trans. of the State Med. Society, vol. iii., p. 354.

Mr. P. H. Chavasse reports nine cases in which its use was followed by the birth of still-born children, and in all before he administered the ergot, "there was every indication of the children being alive."*

Mr. Elkington says that "several of his patients who took it, had still-born children."†

Mr. John Paterson, of Aberdeen, used the ergot in eight cases, and in three the children were still-born—"than which," he says, "no stronger evidence need be adduced of its extreme danger." In the three cases alluded to, he states, that he satisfied himself before its administration that the children were not only alive, but apparently strong and healthy; but as soon as the action of the medicine commenced, these impressions became gradually less sensible to himself as well as to the mother. And he adds his doubts whether by the use of this article more deaths are not occasioned than by the use of instruments.‡

In addition to the foregoing, I adduce the following communication from one of my professional friends in this city, whose long experience entitles

* Trans. of the State Med. Society, vol. iii., p. 354.

† Ibid., vol. iii., p. 354.

‡ Edinburgh Med. and Surg. Journal, for Jan. 1840, p. 142.

Blarian, as quoted by Trousseau, makes the following statement:—"I am convinced that ergot is eminently injurious to the child; after its administration, I have observed that one in five of the children are still-born. Most of those that were born alive were pale, the pulsations of the cord feeble, the movements of the heart almost imperceptible, and it was with difficulty that respiration was established." And he adds that

his opinions in relation to practical matters, to the highest consideration.

New York, January 14th, 1841.

My Dear Sir:

After what I considered a fair and full trial, I formed an opinion on the use of ergot, twenty-five years ago, and one which has governed me in practice ever since. I consider it a valuable article of the *materia medica*, to be used with great caution and only in cases of clear necessity. I have reasons satisfactory to my own mind for believing that it has frequently destroyed foetuses and produced sterility in mothers. Entertaining this opinion I am surprised to see by some late publications that this article continues to be resorted to by some practitioners under very trivial pretexts. I mean on occasions where, to say the least, it is totally unnecessary. It hastens labor, it is true, but I entertain so high a respect for the intelligence of nature, that I consider this hazardous method of bringing a child *into* the

the observations of some of his brethren correspond with his own. Blarian has gone a step further. He made an estimate of the number of still-born children from the year 1826 to 1835, in the town of Gand, and comparing them with the still-born of 1836, he found that during a year and a half the number had doubled in the town of Gand, and he attributes this to the general use of ergot.—*Traité de Therapeutique et de Matière Medicale, Pa. A. Trousseau, et H. Didoux. 3d ed. Paris, 1847, vol. i., p. 812.*

world before its time, as little better than sending it *out* before its time.

Yours truly,

CYRUS PERKINS.

Prof. J. B. BECK.*

The facts which have thus been detailed, would seem to be abundant to show that the use of this article has in many cases proved injurious to the child. That it does not prove so in all cases, and that in the hands of those who have used it prudently and judiciously, it has never produced such an effect, is certainly no argument against the correctness of this conclusion. Even by those

* In a valuable paper by Professor Huston, published so long ago as the year 1829, but which has only very recently attracted any attention, the following statement is made in relation to the effects of ergot:—"My own experience with the article convinces me that it is a most dangerous and destructive drug." As the result of his experience in a number of cases, he adds, "the children were still-born in a proportion shocking to my feelings, and that too when every precaution in its use was observed." In a note he states, "In no other place in the United States, nor perhaps in the world, is ergot so much praised, and by so many distinguished men, as in Philadelphia, and in no other of the principal towns in the United States, as far as their bills of mortality have come under my notice, is the number of still-born children in so large a proportion to the whole number of deaths! Indeed this item in our bills of mortality has become so glaring as to attract the notice of the most cursory reader of our newspapers. For weeks in succession, the editor of one of the daily papers of this city has been calling attention to this subject, and at a time, too, when fiercely engaged in one of the hottest political contests that have ever agitated this nation. Comment is unnecessary!"—*North American Medical and Surgical Jour.* vol. vii. p. 81.

who have most frequently observed its fatal effects upon the child, it is admitted that this does not uniformly take place. The circumstances under which this difference of effect occurs, are easily explicable. As the danger of the child appears to be owing to the degree and duration of the pressure to which it is subjected, it would seem evident that just in proportion as the uterine organs are in a condition to admit of a speedy delivery after the ergot begins to operate, will the danger to the child be lessened; and on the other hand, in proportion as the delivery is protracted, will the danger be increased. This corresponds with the observation of Dr. Ward, already quoted, that whenever the child is not delivered in forty minutes after the action of the ergot commenced, it is generally still-born. For the same reason too it has been found more injurious when used in first labors, than in subsequent ones.

3. *Is ergot capable of producing any effect on the uterus anterior to the full term of gestation?* On this point there is also a great difference of opinion. Some contending that it acts only at the full period and when the process of labor has already commenced; while others assert that it exerts its influence at any period of pregnancy. To settle this question a great number of experiments have been made upon animals, the result of which is, that while in the majority it produced no effect, yet in a number it succeeded.

By Dr. Erskine, several experiments were made

upon cats, at various periods of pregnancy, and in every instance it is stated that he succeeded in producing abortion.*

By Dr. Oslere, experiments were also made upon animals, and with similar results. The first was on a sow, that was supposed to be in her seventh week of pregnancy. One drachm of the ergot was given and repeated again in the course of three hours. In the course of the night she had aborted nine small pigs, about the size of common mice. His second experiment was upon a cow, which was supposed to be with calf, though not sufficiently advanced to be certain of the fact. Two ounces of ergot in powder were given about ten o'clock in the morning, and after suffering severe pain she aborted at six o'clock in the evening of the same day. The abortion was about the size of a common full grown rat, but very imperfectly formed. His third experiment was on a cat that appeared to be near her time of delivery. Sixteen grains of ergot in powder, mixed with butter were given at eight o'clock in the evening, and the animal confined in a room. On visiting her the next morning, she was found to have been delivered of four kittens, all of which died during the day.†

Dr. Oslere states as the result of his experiments, that he has not the least hesitation in be-

* Philadelphia Journal of Med. and Phys. Sciences, vol. xi., p. 112.

† Philadelphia Jour. Med. and Phys. Sciences, vol. xi., p. 113.

lieving that the ergot is capable of producing abortion at any period of utero-gestation.

Dr. Chatard, of Baltimore, tried its effects upon six cats, all more or less advanced in pregnancy. On the first, it acted as an emetic; the second was slightly purged; the third, fourth and fifth, were not at all affected by it, although the last took a double dose of it at once, i. e., two drachms in powder; the sixth, half advanced in pregnancy, to which he gave but one drachm, had her legs paralyzed for a short time, in less than one hour, and abortion took place in twenty-four hours, preceded by considerable hæmorrhage.*

More recently several experiments were made upon different animals, by Mr. Wright, without producing any effect.†

The only inference to be drawn from the foregoing facts, is, that although ergot is capable of causing abortion in animals, it does not do so with any degree of certainty or uniformity.

That ergot has the power of inducing premature labor in the human subject, is now established by such a number of well-attested cases, as to leave no reasonable doubt on the subject.

Dr. Osler, in a paper published in 1825, states that this had been successfully practised by Prof. James, in the case of a woman whose pelvis was too small to permit the passage of a full grown child. She had several times been pregnant, and

* New York Medical Repository, vol. xxi., p. 163.

† Edinburgh Med. and Surg. Journal for Jan. 1840, p. 31.

in every case the operation of embryulcia had been resorted to for her delivery. In a subsequent pregnancy, Dr. James suggested the propriety of bringing on premature labor by the use of ergot, and this was accomplished with success, not only in this but in several subsequent pregnancies.*

Dr. Dewees relates the following case: a female, whose husband had been absent a long time, became pregnant by illicit connection. Wishing to conceal her guilt she applied to a physician, who gave her some powders which he said would produce abortion. After taking several of them, severe pains came on, with hæmorrhage. In this state she was found by Dr. Dewees, and shortly after she was delivered of twins at about the fifth month. On examining a powder which was left, and which was similar to those she had taken, Dr. Dewees found it to be a drachm of ergot.†

The most satisfactory testimony, however, on this subject, is that which has been furnished within a few years by several British physicians. In 1834, Dr. F. H. Ramsbotham, of London, detailed six cases, in which it was necessary to induce premature labor, and in all it was successfully brought about by the use of the ergot. In the first case, the pregnancy had advanced to eight months; in the second, to seven and a half; in the third, to seven and a half; in the fourth, to

* Philadelphia Jour. of Med. and Phys. Sciences, vol. xi., p. 114.

† American Journal of Medical Sciences, vol. iii., p. 408.

seven and a half; in the fifth, to eight; and in the sixth, to seven and a half months.*

In a subsequent paper, Dr. Ramsbotham has given an account of his practice in those cases, in which, from the narrowness of the pelvis, he was obliged to resort to the induction of premature labor. Of these he states that in all he had had sixty-two cases. In thirty-six cases the membranes were punctured, and in twenty-one of these the children were born alive, and sixteen were still-born. In twenty-six the labor was induced by ergot, without any other means being used; of these twelve were born alive, and fourteen still-born. Besides establishing, beyond all doubt, the fact that ergot is capable of exciting the uterus into action anterior to the full term, this report is important in another respect, and this is particularly noticed by the author. It is that the number of still-births in these cases was much greater in proportion in those in which the ergot was used, than in those in which the practice of puncturing the membranes was resorted to. Dr. Ramsbotham adds the remark, that he has seen the stimulating effects of ergot on the uterus in numerous cases of dangerous hæmorrhage in the early months, when it was desirable to procure a complete evacuation of that organ, and where no manual or instrumental means could be put in practice.†

Dr. Paterson, of Glasgow, has reported the case

* London Medical Gazette, June, 1834, p. 436.

† London Medical Gazette for June, 1839, p. 422.

of a woman in whom he succeeded in bringing on premature labor in two successive pregnancies by the use of ergot. In both cases it was about the seventh month.*

A similar case is reported by Mr. Henne, in which the ergot effected a premature delivery at the seventh month.†

Another case occurred under the care of M. Dubois, of Paris, in the person of a dwarf, who in her first pregnancy was obliged to be delivered by perforating the head, and thus bringing away the child. On becoming pregnant a second time, he determined upon bringing on premature labor at the eighth month, by dilating the os uteri and the use of ergot. This was accordingly done with success, and a living child delivered.‡

The foregoing evidence is conclusive as to the fact that ergot does exert its action on the uterus anterior to the full term of pregnancy. What the earliest period is, at which it is capable of producing this effect, it is impossible at present to determine.

4. *To what extent are we justified in using ergot?* If there be any truth or force in what has been said in relation to the effects of this article on the child, the answer to this question is obvious. In a professional as well as moral point of view, we have no more right to trifle with the life of the

* Lond. Med. Gazette for June, 1839, p. 333.

† Ibid., for January, 1839, p. 639.

‡ Dunglison's American Med. Intelligencer, vol. iv. p. 126.

child than we have with the life of the mother. When, however, from the nature of the case, it becomes manifest that the life of the mother is in danger, we are not merely justified in using, but it is a positive duty to do so, every means to save her, disregarding every consequence that may result to the child. Now it is for such contingencies, that I conceive that ergot ought to be reserved. It should accordingly, I think, never be used except in cases where nature is incompetent to a safe delivery. By too many, it is to be feared, it has been and is still used merely as a *time-saving* agent. Than this, I cannot conceive of any practice more unjustifiable and reprehensible. As a general rule, nature is competent to a safe delivery, and we may rest assured that the best plan is to leave her alone to accomplish the work. Artificial and violent interference, whether it be applied in the shape of instruments or by the use of ergot, cannot but be improper.

ESSAY VII.

AN ACCOUNT OF THE ORIGIN OF THE USE OF MERCURY IN INFLAMMATORY COMPLAINTS.

Mercury, although known to the ancients, was not used by them as a medicine. By Dioscorides it is noticed, but as an article exceedingly deleterious in its operation on the system. Pliny also mentions it, but ascribes to it poisonous properties. Galen seems to have been equally ignorant of its true character and properties. It is to the Arabians that we are indebted for first establishing the fact, that when taken internally, this metal is not poisonous. Avicenna states distinctly, that large quantities of it may be swallowed without injury, the metal forcing a passage through the body simply by its specific gravity.* In the shape of external applications, it was used by the Arabians in the treatment of various cutaneous affections.† According to Dr. Friend, the power

* *Argentum quidem vivum plurimi qui bibunt, non læduntur eo. Egreditur enim cum dispositione sua per inferiorem regionem.—Avicen. lib. 4.*

† See Lectures on the Materia Medica, &c. By Charles Alston, M. D., Professor of Botany and the Materia Medica in the University of Edinburgh, 1770, vol. i., p. 83. Also the Medical Works of Richard Mead, M. D., 1762, p. 100.

which mercury, when applied externally, has of causing salivation, appears to have been first established in the 13th century, by Theodorick, a friar, who afterwards became Bishop of Cervia. According to Alston, Paracelsus was probably the first who gave mercurial preparations internally. He died in the year 1541. In the year 1608, calomel was first described by Crollius in his *Basilica Chemica*.* Except in the venereal disease, it was not until during the last century that any extensive use was made of the preparations of mercury; and it was then that it was introduced into the treatment of inflammatory complaints. This practice took its rise in this country, and to the enterprise of American physicians is mainly due the credit of the general introduction of this powerful agent into practical medicine. The circumstances under which it originated, are the following.—Upwards of a century ago, the American Colonies were the scene of one of the most dreadful epidemics that ever desolated a country. It was generally denominated the *putrid sore throat*, and it commenced its career in May, 1735, at Kingston, an inland town of New Hampshire. From thence it spread itself gradually to the neighboring towns and villages. In the month of September of the same year, it reached Boston. Its progress westward was slow but uninterrupted. Nearly two years elapsed before it

* Paris' *Pharmacologia*, p. 52.

reached the Hudson river, from whence it continued to spread to the south and west, until it had involved the whole of the colonies in one common calamity.* The number who fell victims to the disease were immense. Upon the population of New England, more especially, it committed the most dreadful ravages. According to the account furnished by Dr. Douglass, a physician of Boston, it appears that one-fourth of the inhabitants of that place were seized with it, and of these, one in thirty-five died of it. In other places, he states, that one-sixth, one-fourth, and even one-third of the sick fell victims to it.† By Dr. Kearsley, an eminent practitioner of Philadelphia, an affecting account has been left of its devastations. "Like most new diseases," says he, "till their constitution and nature are known, it swept away all before it; it baffled every attempt to stop its progress, and seemed by its dire effects to be more like the drawn sword of vengeance to stop the growth of the colonies, than the natural progress of disease. In the New England governments, the stroke was felt with the greatest severity; villages were almost depopulated, and parents were left to bewail the loss of their tender

* A Letter from Cadwallader Colden, Esq., to Dr. Fothergill, concerning the Throat Distemper, in the *Med. Observations and Inquiries of Lond.* vol. i. p. 215.

† The Practical History of a new Eruptive Miliary Fever, with an angina ulcusculosa, which prevailed in New England in 1735 and 1736. By W. Douglass, M. D. *New England Jour.*, vol. xiv.

offspring, till heaven, at last, the only unerring physician, was pleased to check its baneful influence.”*

Belknap, in his history of New Hampshire, states, that in that province not less than one thousand persons died of the disease, of whom nine hundred were under twenty years of age.†

It was in attempting to arrest the ravages of this dreadful epidemic, that mercury appears to have been first introduced into the treatment of inflammatory complaints, and it is generally conceded that the credit of originality is due to Dr. William Douglass, an eccentric but eminent physician, of Boston. The preparation of mercury which he used was calomel. The following is his language in relation to it. “Where nature required any assistance, the principal intentions were with regard to the cuticular eruption and the *ulcusclosa* in the throat. Any affection in the throat does frequently produce a natural *ptyalism*; *mercurials* used with discretion, are a kind of specific in such like ulcers and *ulcusclosa*, and in fact, here they moistened the throat and mouth, stopt the spreading of the *ulcusclosa*, and promoted the casting off of the sloughs; and as an accessory advantage, (the patients being mostly children,) destroyed worms. Amongst all the preparations, *calomel*

* Observations on the Angina Maligna, or the Putrid and Ulcerous Sore Throat, with a method of treating it. By John Kearsley, Jr. Gentlemans' Magazine, vol. xxxix., p. 521.

† History of New Hampshire. By Jeremy Belknap, vol. ii. p. 95.

answered best, the gentle vomiting, or few stools that it occasioned in some, did not confound the natural course of the distemper. Turbeth proves generally too strong a revulsion, and the eruption is thereby too much diverted. This distemper did not well bear any other evacuations but *mercurials*.”*

This was published in the year 1736, and is the first notice we have of the practice. Although Dr. Douglass was thus the first to introduce the practice, yet the person who carried it to the greatest extent, and who seems to have regularly systematized it, was Dr. Jacob Ogden, a respectable physician of Long Island. In some letters† which he published on this subject, containing the results of twenty years’ experience, he commences by observing, that alexipharmic and sudorific medicines had long been esteemed as the basis of a radical cure in this disease, and had accordingly been universally recommended by writers on this subject. An ample experience, however, of these, as well as other remedies, represented as specifics, convinced him of their complete inadequacy in subduing the disease, and prompted him to resort to a new method of treatment. He accordingly, about 1749, tried the effects of mercury, joined with alexipharmics and astringents, which succeeded, as he states, “even beyond his expecta-

* New England Journal, vol. xiv., p. 4.

† See New York Medical Repository, vol. v., p. 97, where these letters are reprinted.

tions." *Calomel* was the form in which it was given, and the usual quantities were, to a child of a year old, two or three grains; to one of six or eight years, from four to five grains; and to a grown person, six or eight grains, repeated every twelve, sixteen, twenty, or twenty-four hours, as the urgency of the symptoms indicated. Generally speaking, he states, that this treatment arrested the disease in two or three days, provided it was commenced early. In alarming cases, or where the disease had been neglected, the remedy was given more freely. In one case, sixty-two grains were given in the course of twelve or fourteen days, to a patient nine years of age, and with perfect success.

In consequence of the reputation which calomel thus acquired in the treatment of this disease, it came very naturally to be resorted to in other inflammatory diseases, and accordingly, about the middle of the last century, it was in common use in pleurisy, pneumonia, inflammatory rheumatism, and other of the phlegmasiæ. The common practice was to give it in large doses, when used as a cathartic; and when given as an alterant, or to affect the system, in doses of one or two grains; and this was combined with camphor, antimony, or opium, according to circumstances—a practice precisely similar to that of the present day. On this subject we have the positive testimony of the venerable Dr. Holyoke of Salem, who says, "I profess myself to have been in the habit of pre-

scribing this mineral (mercury) ever since the year 1751 or 1752. About that time, pleurisies and peripneumonias were remarkably prevalent, and might be called epidemical; the practitioners of this place made free use of it at that time, and as we found its effects beneficial, have continued to employ it in similar cases ever since.”* Concerning the use of mercury in Philadelphia, between 1760 and 1766, Dr. Rush has left us the following account: “Mercury was in general use in the years that have been mentioned. It was given to prepare the body for the small pox. It was administered by my first preceptor in medicine, Dr. Redman, in the same disease when it appeared in the natural way, with malignant or inflammatory symptoms, in order to keep the salivary glands open and flowing, during the turn of the pock. But to Dr. Thomas Bond is the city of Philadelphia indebted for the introduction of mercury into general use in the practice of medicine. He called it emphatically, ‘a revolutionary remedy,’ and prescribed it in all diseases which resisted the common modes of practice. He gave it liberally in the cynanche trachealis. He sometimes cured madness, by giving it in such quantities as to excite salivation. He attempted to cure pulmonary consumption by it, but without success; for at that time the influence of the relative

* See a Letter on the Introduction of the Mercurial Practice in the vicinity of Boston. By Edward A. Holyoke, M. D., in the New York Medical Repository, vol. i., p. 490.

actions of different diseases and remedies upon the human body was not known, or if known, no advantage was derived from it in the practice of medicine.”*

The foregoing is a sketch of the origin of the mercurial practice in this country, and it is very certain from this, that it prevailed here long before it was known or practised in any other country. I have been the more minute in the preceding account, because I was desirous of correcting an error, into which one of the most popular writers of the present day has fallen, on this subject. I mean Dr. John Armstrong, the accomplished author of the work on typhus, who gives the sole credit of the practice to Dr. Robert Hamilton, of Lynn Regis.† From the account furnished by Dr. Hamilton himself,‡ it appears that he was entirely ignorant of the powers of mercury in inflammation, until his attention was called to it, in the year 1764, by a British Navy Surgeon who had become acquainted with its use in the treatment of hepatitis in the East Indies. Having tried it in that disease, and found it successful, Dr. Hamilton entered into some generalizations on the subject, and drew the conclusion that it might be rendered available in the other forms of inflam-

* Observations and Inquiries, vol. iv., p. 398.

† Armstrong on Typhus, p. 327.

‡ See a Letter from Dr. Robert Hamilton to Dr. Duncan, giving an account of a successful method of treating inflammatory diseases by mercury and opium. *Med. Commentaries for 1783*, 4 & 5. vol. 5, p. 120, Amer. ed.

matory disease. The whole paper is that of an able and thinking man, and has elicited a high, though just tribute of praise, from the writer already alluded to.* It may fairly be inferred, from the account given by Dr. Hamilton, that he was unacquainted with the fact of the extensive use of mercury in this country, and therefore it detracts but little from his merit, that the very same practice which he recommended, and in the very same diseases, had been in common use here many years before his paper made its appearance.

* “The paper originally published by Dr. Robert Hamilton, notwithstanding some of its defects, deserves to be engraved in letters of gold, on account of its great practical application and utility.”—Armstrong on Typhus, &c., p. 385 : Amer. ed.

ESSAY VIII.

ON THE DEATHS FROM POISONING, IN THE CITY AND
COUNTY OF NEW YORK, DURING THE YEARS 1841,
42, AND 43; OBTAINED FROM THE RECORDS
OF THE CORONER.

Believing that the records of the coroner of so extensive a population as that embraced in the city and county of New York, might afford some valuable materials, worthy of publication, I applied some time since to that officer to furnish me with a list of such inquests for poisoning as had come under his jurisdiction, accompanied with an account of the various circumstances of interest connected with each case. He promptly complied with my request, and furnished me with the materials from which I have prepared the following table. The gentleman who held the office of coroner during the years 1841, 42, and 43, was Dr. C. B. ARCHER,* and I believe that I express the common opinion of the profession, when I say that the duties of it were performed by him with great fidelity and ability. Dr. Archer was, I believe, the first medical man who has held this

* Since deceased.

situation in this county. His successors have also been medical men, and I should hope that the principle is now established, (in this county at least,) that the office belongs of right to the medical profession. It seems strange indeed, that it should ever have been considered otherwise. No one who is not a physician, let him be ever so intelligent in other respects, is competent, from the very nature of the case, to perform its duties. Were the public justly to appreciate the functions of the coroner, and did they reflect how greatly the due administration of justice in criminal cases depends upon the preliminary investigations of this officer, one would suppose that none other than an intelligent physician would ever be tolerated. The public have, however, hitherto judged differently, and the examination of the most intricate questions, involving character and life, has been committed to the jurisdiction of men profoundly ignorant of every thing relating to these questions. That this is a great public evil cannot be questioned, and the correction of it ought to be attempted as speedily as possible. No legislative act can of course touch the case, and it only remains for the united profession to exercise their influence in endeavoring to awaken the public mind to a just appreciation of the subject.

The Poison used.	Quantity taken.	Time between Tak'g & Death	Age of Person.	Sex.	Cause.
Arsenic	Unknown	8 hours	25 years	Male	Suicide, from melancholy.
"	"	Unknown	40 "	"	do insanity.
"	"	10 hours	50 "	"	do
"	"	24 "	30 "	"	do
"	"	Unknown	45 "	"	do
"	"	8 hours	25 "	female	do
"	"	4 "	4 "	"	Accidental.
"	"	2 days	18 "	"	do
"	2 drachms	10 hours	50 "	"	Unknown.
"	Unknown	Unknown	26 "	male	do
"	"	"	36 "	female	Suicide.
"	1 drachm	18 hours	40 to 50 years	male	do.
" and gin	Externally applied	24 "	5 "	female	Applied for scald head.
Opium	Unknown	Unknown	45 "	male	Intemperance.
"	1½ ounces	8 hours	25 "	"	Suicide, melancholy.
"	1 ounce	15 "	27 "	"	do.
"	Unknown	20 "	48 "	"	do.
"	1 drachm	Unknown	28 "	"	Intemperance.
"	Unknown	12 hours	25 "	female	Suicide.
"	"	18 "	5 mon. 2 days	male	By mistake.
"	"	10 "	19 years	female	Suicide.
"	1 ounce	12½ "	27 "	male	Intemperance.
Laudanum	1 drachm	24 "	2 months	"	Incautiously given by the mother.

Laudanum	2 ounces	16 hours	44 years	male	Dejection.
"	1 ounce	18 "	36 "	female	Jealousy.
"	12 ounces	12 "	47 "	male	Mistake.
"	1 ounce	7 or 8 hours	36 "	female	Intemperance.
"	Unknown	48 "	66 "	male	Pecuniary embarrassment.
"	$\frac{1}{4}$ drachm	13 "	6 weeks	"	Mistake of the apothecary for paregoric.
"	"	14 "	10 months	"	do.
"	$\frac{1}{2}$ ounce	9 "	Unknown	female	Suicide.
"	1 "	6 "	49 years	male	do.
"	1 "	Unknown	35 "	female	Intoxication.
"	6 drachms	"	43 "	male	Suicide.
"	1 $\frac{1}{2}$ oz. supposed	5 hours	30 "	"	do.
"	Unknown	Unknown	27 "	female	do.
"	1 ounce	"	47 "	"	do.
"	Unknown	2 hours	19 "	"	do.
"	5 to 6 drachms	Unknown	30 "	"	do.
"	8 drops	6 hours	26 days	"	Administered by nurse in mistake.
"	Unknown	Unknown	38 years	male	Suicide.
"	1 ounce	"	32 "	"	do.
"	Unknown	"	36 "	"	do.
"	"	6 to 8 hours	34 "	"	do.
"	"	Unknown	28 "	female	do.
"	1 drop	12 hours	1 week	male	Given by the mother to put child to sleep.
"	$\frac{1}{2}$ ounce	10 "	45 years	"	Suicide.
"	Unknown	Unknown	37 "	"	do.
"	"	7 hours	42 "	female	do.
"	"	Unknown	50 "	male	do.
"	"	"	Unknown	"	do.
Laudanum					
"					
"					

The Poison used.	Quantity taken.	Time between Tak'g & Death	Age of Person.	Sex.	Cause.
"	1½ ounces	6 hours	31 years	female	do.
"	"	Unknown	26 "	"	do.
"	1 ounce	"	5 "	male	Willfully administered by the mother.
"	½ ounce	17 hours	23 "	female	Suicide.
"	Unknown	14 "	1 month	male	Given through ignorance.
"	"	12 "	10 "	female	Carelessness on part of mother.
"	"	Unknown	25 years	male	Suicide.
"	"	"	53 "	"	Unknown.
"	"	12 hours	50 "	"	Suicide.
Solution of morphia	2 oz. supposed	Unknown	28 "	"	Intemperance.
"	Very large quantity	20 hours	17 "	"	Suicide.
"	1 drachm	10 "	4 months	female	Carelessness of the mother.
Paregoric	15 to 20 drops	14 "	8 "	male	Through ignorance.
Corrosive sublimate	Unknown	4 "	35 years	female	Suicide, in consequence of domestic quarrel
"	"	3 h. after discy	38 "	male	Unknown.
"	"	7 days	Unknown	"	Taken as a specific for gonorrhea.
Tinct. of colchicum	½ ounce	13 hours	3 yrs. 4 mos.	female	Accident, taken by the child itself.
Sulphuric acid	Unknown	24 "	2 " 10 "	male	Accident.
"	"	3 days	23 years	female	Suicide.
Tinct. sanguinarie	"	1 day	26 "	"	Persons at the Bellevue Hospital, who took it by mistake for brandy.
"	"	28 hours	32 "	"	
"	"	36 hours	30 "	"	
"	12 ounces	12 "	47 "	male	

	½ drachm	12 days	26 "	female	Mistake.*
Tartar emetic	1 pint	12 hours	Unknown	male	Drank because another offered to pay for it.
Ardent spirits	6 oz. conjectured	47 "	9 years	female	Taken accidentally.
Gin	10-16 grain	5 "	30 "	"	Ignorance.
Strychnia	Unknown	Unknown	27 "	"	Intemperance.
Alcohol & Laudanum	"	1 day	36 "	"	Unknown.
Brandy and do	"	Unknown	35 "	male	Suicide.
Prussic acid	"	16 hours	2½ "	female	Accident.
Sol. carb. potass.	"	2 days	2 "	"	do.†
Phosphorus					
		Total, 83.	Of these in 1841—34.		
			1842—22.		
			1843—27.		

* The mistake in this case was on the part of the apothecary, who put up *tartar emetic*, in place of *tartaric acid*, for soda powders. Excessive vomiting and purging followed and consecutive gastro-enteritis, which destroyed the patient after an illness of twelve days.

† This child died in consequence of swallowing the charged ends of some loco-foco matches, which she got hold of in the absence of the mother.

From the foregoing it appears that of the preceding cases there were, of males 46, females 37. Of those, poisoned by

Arsenic, 13	Ardent Spirits, . . . 1
Opium, 8	Gin, 1
Laudanum, . . . 39	Alcohol and Laud. . 1
Paregoric, . . . 1	Brandy and do. . . 1
Solution of Morphia, 3	Strychnia, 1
Corrosive Sublimate, 3	Prussic Acid, . . . 1
Colchicum, . . . 1	Phosphorus, 1
Sulphuric Acid, . . 2	Carbon. of Potassa, 1
Tinc. of Sanguinaria 4	—
Tartar Emetic, . . 1	83

Of the 83, there were, suicides, 50

Taken by mistake, or through ignorance, &c. 28

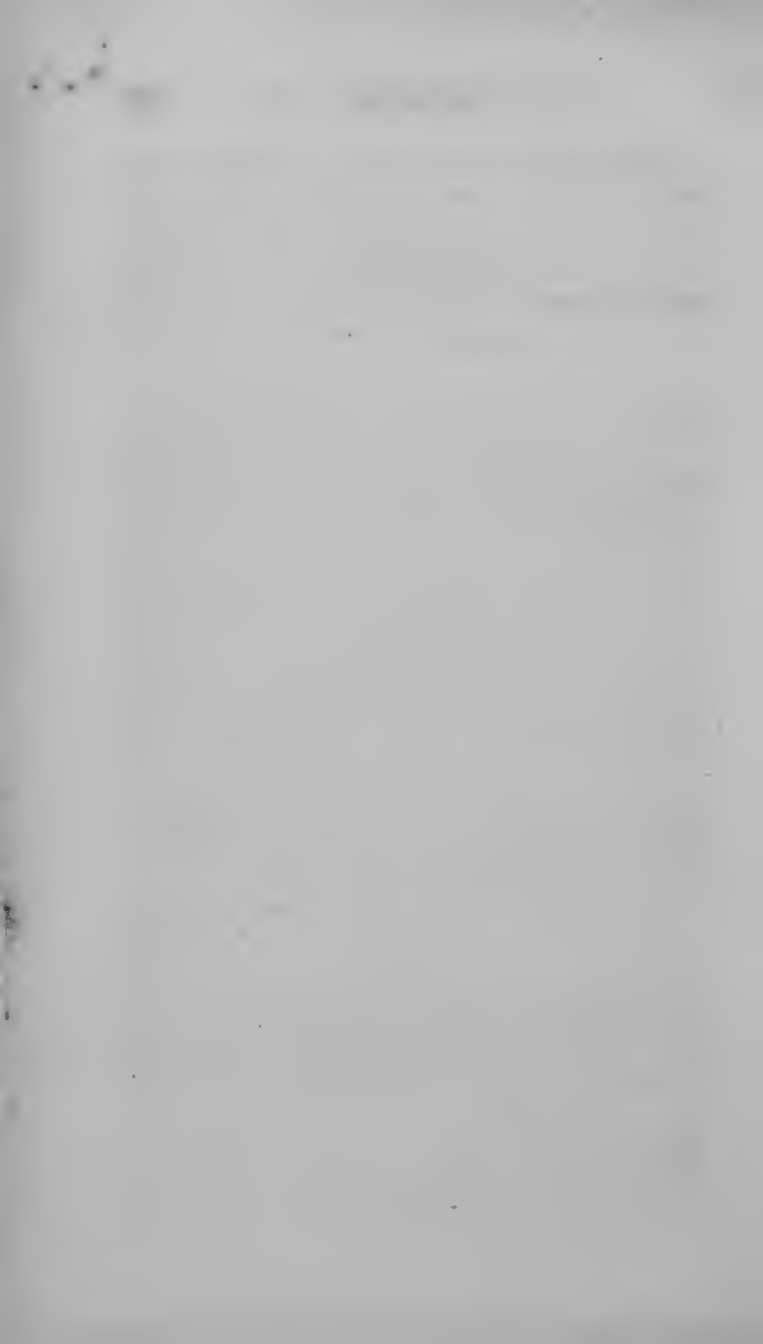
Unknown, 5

It appears that the two poisons principally used were *arsenic*, and *opium*, in some of its forms.

In the cases of poisoning by *arsenic*, the smallest quantity taken was one drachm, and the largest two drachms. The shortest time intervening between the taking of the poison and the death, was four hours, the longest two days.

In the cases of poisoning by *opium*, the smallest quantity was one drachm, the largest, one and a half ounce. The shortest time between the taking and death, 8 hours, longest, 20 hours. Average time of six cases, 14 hours.

Of the cases of poisoning by *laudanum*, the smallest quantity was *one drop*, the largest, was 16 ounces. The shortest period between taking and death, 2 hours, the longest, 48 hours. Average of 23 cases, 12 hours.



APPENDIX.

I.

*Death of a child from giving a drop of Laudanum.
By N. V. Woolen, M. D., of Loundesboro', Ala.*

Southern Med. and Surg. Jour. for July, 1849. Ed. by Paul F. Eve, M. D.

"A fine, healthy female child, in the fifth day of its age, suffered from 'gripping,' as its mother supposed, for which she administered to it *one* drop of laudanum. Thirty minutes afterwards, its breathing became slow and stertorous, and other symptoms of narcosis came on. Notwithstanding every effort made, the child died in eleven hours after taking the laudanum.

"The laudanum was dropped from an ounce vial, in which there were but about ten drops. It had been stopped with a piece of twisted paper, and hanging up about a year, all the inner surface of the lower part of the vial was encrusted with opium, and the remaining laudanum was heavily charged with this deposit resulting from evaporation."

II.

Trial of a nurse for poisoning an infant by giving it two drops of Laudanum.

An interesting case was tried not long since (October, 1846) before a coroner's jury, in which a nurse was charged with having destroyed an infant by giving it two drops of laudanum. The child was a fine healthy boy, aged five days. Mr. King deposed that the nurse had given it two drops of laudanum about three o'clock in the morning, that its death took place at nine in the evening, and that he believed the cause of its death was an over dose of laudanum. By order of the coroner Mr. King made a *post mortem* examination, for the purpose of ascertaining whether there might not have been some other cause of death. Nothing, however, could be discovered, and Mr. King persisted in the opinion that from all the symptoms, the laudanum was the cause of death. It appeared that the bottle from which the nurse took the laudanum contained about two drachms and that it had been in the house eighteen months. Mr. King thought the strength of it had in this way been much increased.

The following verdict was returned by the jury:—"That the child died from the effects of two drops of laudanum, administered to it by the

nurse, and having been frequently attended with good effects, through good intent; that is to say, *excusable homicide!*"

It is added, "The nurse had before administered laudanum to children to ease their pains. The coroner considered the verdict in direct opposition to the law as held by the authorities, referred to by him in summing up, and adjourned the inquiry till Saturday evening, when he agreed to receive the verdict; and after an admonition and caution to the nurse as to her future conduct, the jury were dismissed." *London Medical Gazette for Nov. 6, 1846, from the Provincial Medical Journal, Oct. 28.*

III.

Case in which a large quantity of Opium was given to a child for Strangulated Hernia.

Very recently the liberal use of opium in the young subject has been recommended in a case in which it appears to have been not merely justifiable, but to have been attended with happy effects. Dr. Joseph Reid of England, reports a case of strangulated hernia, in an infant eleven months old, on which he was about to perform an operation, but which was obviated by giving opium to the extent of getting it fully under the influence of that drug. During this state, the protruded gut returned of itself into the abdomen. He concludes by observing, "this case argues strongly in favor of the opium treatment in similar instances; and I consider it to be better adapted to strangulated hernia *in infants* than to cases of the same description occurring in the adult. No doubt opium diminishes pain and sickness of stomach in both young and old; but pain in the child is always accompanied by crying and convulsive sobbing, which cause a bearing down, and therefore greater pressure on the protruded parts; thus affording no slight obstacle to the successful operation of the taxis, and consequently to the recovery of the child without

undergoing the pain and dangers of an operation." The quantity of opium given in this case is not stated. *London Lancet for Sept., 1850.*

Would not the inhalation of ether in cases of this kind be a more safe and prompt remedy?

IV.

Observations on the sedative effects of Tartar Emetic.

With regard to the sedative operations of antimony, some interesting observations were made by Trousseau and Pidoux, as the results of numerous experiments made by themselves. From these I extract the following :

“For several years we have been in the habit of giving preparations of antimony to a large number of patients attacked with non-febrile affections, such as sciatica, rheumatism and chronic catarrhs, nocturnal syphilitic pains, &c., &c. The great circulation, respiration, urinary secretion, have experienced very important modifications.

“1. Circulation.—The pulse became more feeble, slower; the impulse of the heart, examined with the stethoscope, was in harmony with the pulse. We have seen the number of pulsations fall in three days from 72 to 44, and remain a long time at this last number. Most generally the force of the pulse is diminished in a very perceptible manner, but the number of the pulsations rarely falls below a fifth or a fourth. We have in a certain number of cases observed a singular phenomenon which follows the administration of antimony; the pulse becomes excessively irregular without losing anything of its

frequency. This irregularity remains sometimes during the whole duration of the medication; but most frequently it precedes and announces the diminution in the number of the arterial pulsations. Some circumstances which we shall indicate presently, prevent antimony from having any perceptible action on the system of the lesser circulation.

“2. Respiration.—We have seen the number of respiratory movements diminish so much that patients subjected to the experiment, only breathed six times in a minute, when before, they breathed 16, 20 and 24 times, and it would have given rise to some uneasiness if we had not been encouraged by the good countenance of the patient, and by his assurance of being comfortable. It is very remarkable that a medicine which exerts so powerful an action on the movements of the heart, and upon those of the inspiratory muscles, should not debilitate the muscular system of the life of relation, and that patients should preserve their strength, the integrity of their intellectual faculties and that of all the organic functions, at the same time that two general functions so essential, experience an immense perturbation.”

V.

Death of a child from the use of Tartar Emetic.

Case by Dr. N. B. Pickett, of Great Barrington, Massachusetts. "A child about three years old, of robust, healthy appearance, was subject to asthma; to relieve the turns of wheezing, the physician left a solution of antimony, with directions to give frequent doses until the child vomited freely. This for a time operated well; but the dose was enlarged, yet no emesis could be perceived. True to the directions, the mother repeated the dose so frequently, that *hypercatharsis* and general prostration began to alarm the parents for the safety of the child. I was sent for and found him in *articulo mortis*. The dysentery, as they termed it, had been running on for some days. He was now insensible, the sphincter ani perfectly relaxed, surface cool and moist, constant rolling of the head, livid countenance, indicating that the brain was suffering, and death at hand. He died within a few hours, and his death was evidently caused by the too free use of antimony." *Boston Medical and Surgical Journal*. Feb. 7, 1849.

VI.

On Bleeding ad deliquium in Croup.

One of the strongest advocates of this practice is Professor Chapman, of the University of Pennsylvania. As Dr. Chapman appears to entertain opinions directly the reverse of most of those contained in the preceding work, I will give him the benefit of a quotation from his essay on croup. He says, "Children sustain better than adults, the operation of the most active remedies, as vomiting, purging, sweating, blistering, and I add without hesitation, bleeding.

"During the growth of the body, the *fluids* in relation to the *solids*, are larger in proportion, as is distinctly proved. This fullness of their vessels and greater excitability of system, render children peculiarly liable to inflammatory attacks. Nearly all their complaints partake of this character.

"It follows therefore, that they require *oftener to be bled*, and my own experience convinces me, that venesection may be resorted to in their cases, with more safety and decidedly greater advantage. No one who is conversant with their diseases, and has practised venesection much in them, can withhold his assent to the accuracy of this statement." *Chapman on Croup, in Phil. Journal of the Med. and Phys. Sciences, vol. 1, p. 312.*

In accordance with these views, Dr. Chapman recommends bleeding *ad deliquium animi* in croup, and he adds, "When pushed to this extent, I may almost say, that venesection is invariably successful. As yet, I have never known one instance in which it failed. The moment that syncope takes place, the hoarseness, cough, impeded respiration and fever disappear." *Ibid.*, p. 303. Strong language all this.

Now as a commentary upon all this, let us see what Dr. Chapman says a few pages after this, in the same paper, when speaking of the post mortem appearances.

"Not a little is said of the existence of a membrane in the larynx, and to which so much is ascribed in occasioning death, that an operation has been proposed and was practised for its removal. That it does occasionally exist, cannot be denied, though I suspect rarely, as I never met with it in my repeated examinations for this purpose.

"The appearances I have observed in dissections relating to the larynx, were slight marks of inflammation with more or less of mucus, such as is formed by all the secreting surfaces. Why I have not seen the membranous production, is perhaps susceptible of explanation. To throw out coagulable lymph, of which it is composed, requires the vessels to be highly excited, a state which, by the copious depletion adopted in the

cases that came under my notice, was probably prevented." *Ibid.*, p. 309-10.

Putting this and the previous paragraph together, what is the amount of it? Why the very treatment which Dr. C. "had never known to fail," is brought in to account for certain morbid appearances which in "his repeated examinations for this purpose," he had observed.

VII.

ERGOT.

With regard to the manner in which ergot proves deleterious to the foetus, different opinions are entertained. Since the article in this volume was published, some observations have appeared, especially by Drs. Beatty and Hardy, which are so practically interesting, that I shall offer no apology for quoting liberally from them.

On the influence of Ergot of Rye on the Foetus in Utero. By Thomas Ed. Beatty, M. D.

Dublin Journal of Medical Science, May 1, 1844. Vol. 25.

"It requires to be used with great discretion, for while it will in one case effect the delivery of a living child, it will in another destroy the life of the child before birth, or operate so injuriously upon it as to cause its death shortly after it is born; or produce a peculiar effect on its nervous system which I have observed, and will presently describe, but which I do not find described in any work that I have perused.

"The difference of effect upon the infant depends upon the length of time that intervenes between the administration of the dose to the mother and the conclusion of the labor. If this takes place quickly no mischief is done to the child; if it be alive when the medicine is taken, it will be born

so; but if a delay of over two hours should occur, the probability is the child will be still-born. It is, I believe, generally imagined (and I entertained the opinion myself until lately) that the death of the child is owing to the kind of action excited in the uterus by the ergot, differing from the natural labor pain in this, that after the contraction of the uterus has been excited, no complete relaxation of its fibres takes place; there is an occasional increase in the strength of the effort, but it never relaxes, so long as the influence of the ergot continues. It is, as it were, one continued pain, at times greater, but never entirely ceasing. The effect of this continued contraction of the fibres of the uterus upon the great blood-vessels which traverse its walls to reach the surface of the placenta, must be to intercept the circulation to a certain degree. Now although this cause contributes, no doubt, in some cases to produce unfavorable effects upon the child, I am disposed to think that it is not the only cause of fatal mischief in all, but that in some there is a noxious influence exerted on the nervous system of the infant, producing results of different degrees of intensity, and that these efforts vary from the death of the infant, to certain spasmodic affections of the muscular system after birth." *pp.* 204-5.

After detailing some cases of still-birth after the use of ergot, he says:

"In the cases just recorded, the condition of

the infants was very unlike that of still-born children delivered under ordinary circumstances, and when no ergot had been administered to the mother. *The distinguishing characteristics are, the general lividity of the surface, the universal rigidity of the muscular system, producing the stiffened limbs and clenched hands in those infants in whom life was extinguished, and the remarkable kind of alternating spasm and palsy which supervened in those that were resuscitated.* The nearest approach to this state in new-born children, and that which most resembles it, is the condition in which children are born dead, with symptoms of congestion of the cerebral vessels, in whom, it is true, we find the countenance suffused and livid, but the peculiar affection of the muscular and nervous systems is wanting. Children presenting this appearance of congestion are usually born after difficult labor; but in the instances above detailed, this was not the case; some of them were tedious, but none of them difficult."

"It is plain that the longer the time that elapses after the medicine has been taken into the stomach of the mother, the more certainly will its noxious principles be absorbed and mixed with her blood, the more certainly also will these principles be transmitted to the foetus by the constantly arising current of blood through the umbilical vein, and the more likely will the foetus be to suffer from their effects.

"From these considerations I think we are jus-

tified in coming to the conclusion, that the administration of ergot of rye to a woman in labor is attended with danger to the child, whenever a time sufficient for the absorption and transmission of noxious properties elapses before the child is born; and from the cases above stated I am inclined to place two hours as the limit of safety, and to consider a prolongation of labor beyond that period as perilous to the infant.

“It would appear that the *degree* of effect produced, differs with the time that elapses between the exhibition of the dose and the birth of the child. In some we find spasm and lividity, without capability of being restored to life; in others resuscitation was followed by convulsions terminating in idiotcy, with alternate spasm and palsy. In others the convulsions were followed by death at a remote period; and in others the life of the child was completely extinguished before birth.

“Two practical deductions may be drawn from these observations; first, the ergot should never be given in any case when there is a likelihood of the labor lasting more than two hours after its administration, except when it may be employed to secure the life of the mother, as in the cases of placenta presentation and accidental hæmorrhage above quoted, (cases VIII. and XI.) and secondly, that if we find delivery is delayed to two hours, we should resort to artificial assistance to save the life of the child.” *pp.* 217–18.

VIII.

Observations on the administration and effects of Ergot of rye, on the parturient female and her offspring, when administered during labor. By Samuel L. Hardy, M. D. and assistant physician to the Lying-in Hospital, &c.

Dublin Journal of Medical Science for May, 1845.

“Time when the action of ergot upon the uterus commences.—From comparing tables which I have drawn up, it appears that in some cases ergot acts on the uterus so soon as seven minutes after its exhibition, whilst in others a much longer period of time is required ; but in the generality, from ten to fifteen minutes may be stated as the average. In those cases where the children have been expelled alive, I have always observed the action of ergot on the uterus to commence within twenty-five minutes. On the other hand, when a longer period than this elapses before the uterus takes on action, the use of instruments has been necessary to perfect the delivery, or the children have been dead-born.

“In some instances the ergot has produced in the uterus a kind of tonic contraction, without any effective expelling pains.

“In accordance with what has been observed by

others, I have noticed that in those cases where the ergot acts beneficially, its exhibition is followed by strong expulsive pains, which gradually increase in frequency, so that in fact, they may be found to run into each other, there being no distinct interval between them.

“*Effect on the Pulse.*—The action of ergot on the maternal circulation is a subject of considerable interest, and, so far as I am aware, has not received the attention it deserves from practitioners. This is a fact of great importance, and one, of the truth of which I have convinced myself by repeated observation.

“In nineteen cases of those I have recorded, there was a marked diminution in the frequency of the mother’s pulse, following the administration of ergot, and this effect generally began to take place, from about fifteen minutes to half an hour. In all these instances, when the depression of the pulse occurred, the foetal heart underwent a similar change.

“From the consideration of this fact, a practical question naturally arises, namely, is ergot a safe remedy in a case where the woman is greatly reduced by hæmorrhage arising from relaxation of the uterus after delivery? A case bearing exactly on this point, occurred in No. 3 ward of this Hospital about three years ago, where a draining had continued for several hours after the expulsion of the placenta, by which the patient was greatly weakened; the usual dose of

powdered ergot was given, and was followed almost immediately after by most alarming depression, requiring the exhibition of the most powerful stimulants.

“ In several of the cases where the circulation of the patient had undergone this depression, from the action of ergot, the effect continued for several days, notwithstanding, in some instances inflammation of the uterus followed delivery, and the uterine tumor, not unfrequently remained much larger than natural, even where there was no reason to suspect the presence of inflammation of that organ.

“ *The effects of Ergot on the foetal heart.*—The effect of ergot on the foetal heart is even still more remarkable than on the maternal pulse, and in a practical point of view, deserves much more serious investigation and research.

“ By referring to the tables it will be found that in the great majority of cases, a diminution in the foetal heart's pulsation followed the exhibition of ergot. The period at which this effect begins to be produced, varies from about fifteen minutes to half an hour, sometimes a little sooner and occasionally at a later period.

“ The most common effect, and usually the first that I have observed, is a diminution in the frequency of the pulsations ; this is succeeded, after some time, by an irregularity in its beats, which irregularity continues more or less until the

sounds intermit, and at length, after a variable period, become quite inaudible.

“There is a practical inference which my own observations have led me to, with respect to the changes in the foetal heart, namely, that in those cases where the number of its pulsations have been steadily reduced below 110, and at the same time, *with intermissions*, the child will be rarely, if ever, saved, although its delivery should be effected with the greatest possible speed.

“In making this statement, I may be allowed to say, that the mere depression of the foetal heart below 110, *without intermissions*, is not in itself, sufficient to cause this result, as instances have occurred, where the number of pulsations have been still more reduced (in one case so low as 56,) and yet by speedy delivery, and adoption of the usual remedies, the children have been saved. But in none of these instances was there a *steady, distinct, and well marked intermission*.

“The knowledge of these facts points out the necessity of watching closely the change in the foetal heart, after the administration of ergot, as delay beyond a particular time cannot be allowed with impunity to the life of the child. Should the case in other respects be eligible for the application of the forceps or rectis, in order to save the child, it must be had recourse to within a certain period, which can only be known by a careful use of the stethoscope.

“On this subject, I am happy to state, my ob-

servations fully coincide with those of Dr. Beatty, who fixes the limit beyond which the child will rarely be born alive, at two hours. To this rule I have met with but three exceptions, (vide cases I, IV, and XIII, in tables.)

"It by no means follows from this, that a period of two hours should elapse from the exhibition of ergot, until the expulsion of the child. In two instances (cases XX, XXI,) the children were lost, although only twenty minutes in one, and twenty-five in the other, had passed from the administration of the ergot to their expulsion. Different opinions have been advanced as to the cause of the child's death, some supposing this event to result from the vigorous contractions of the uterus, which others believe the ergot to exert a poisonous influence on the life of the child. Perhaps the combined effects of both these agents may sometimes cause it.

"In numerous instances I have observed the foetal heart undergo all these changes, where very little uterine action, and sometimes none whatever, followed the exhibition of ergot, on which account, I am led to believe that the depressed state of the foetal circulation must arise, not from uterine contractions, but from some deleterious influence exerted by the ergot. Its effects on the mother's pulse corroborate this opinion.

"These depressing effects are so great, that frequently after birth, a considerable time elapses before the children can be perfectly restored;

and I have observed, that infants born in a weak state, where no ergot was given to cause their expulsion, have been restored to animation, with much less difficulty than in those cases in which this medicine was exhibited during labor." *pp.* 225-6-7-8.

IX.

Observations on Ergot.

From the Charleston Medical Journal and Review

In a review of this work, the Editors of the Charleston Medical Journal express the following opinion on this subject :

“Ergot may be administered with perfect safety to the child, provided its delivery be completed within thirty or forty minutes after its action upon the uterus becomes apparent. If, however, labor be delayed beyond this period, the child is invariably still-born ; from this state it may or may not be resuscitated, most probably the latter. The cause of the death of the foetus, under these circumstances, depends, we think, neither upon a directly poisonous effect of the ergot, nor upon the long continued pressure to which the child is subjected ; but to the too early detachment of the placenta. The strong and powerful contractions produced by the ergot, not only assist the expulsion of the foetus, but they also cause a detachment of the placenta before the birth of the latter, and thus destroy its life by cutting off its circulation, if the delivery be delayed beyond the period specified. We were first induced to adopt this view of the matter from the occurrence of a case in which it became necessary

to administer ergot, from complete atony of the uterus, the child being then alive. Delivery was delayed nearly an hour, and the child was still-born, the cord being perfectly placid and pulseless. This condition of the cord induced an instant examination of the mother, when the placenta was found lying completely in the vagina; the uterus was small and very hard. When the placenta was removed, no blood escaped from it, and it presented the appearance of having been squeezed after its detachment. Suspecting that the cause of the death of the foetus might have been the detachment of the placenta before the birth of the child, the next case in which it became necessary to administer the ergot was carefully watched. The child, however, was speedily expelled, and was born alive. One or two cases, however, have occurred, in which the delivery was delayed a considerable period after the action of the ergot on the uterus became evident, and the phenomena presented in all these cases were identical, viz., a still-born child, a flaccid, pulseless cord, the uterus small and hard, the placenta lying in the vagina, even when the examination of the mother was made the instant after the child's birth. From the constancy with which these phenomena have been exhibited in all cases of still-birth, after the use of ergot, we have been induced to place the child's death to the account of detachment of the placenta. When delivery takes place speedily after the action of

the ergot, there is not time for the entire separation of the placenta; where on the contrary, labor is delayed, the powerful contractions of the uterine fibres separate the placenta so long before the birth of the child, that it is destroyed by the arrest of its circulation. The only reason why this explanation has not been previously proposed, we imagine to be, that in cases of still-birth, the attention of the accoucheur is entirely devoted to the child, and the condition of the uterus and placenta, at the period of the birth, is unknown. The cases in our hands have been too few to enable us to announce this fact as positive and absolute. It is proposed to those in the profession, whose experience may enable them to determine whether the state of things described as existing in our patients, is of universal occurrence; if it is found to be so, then the mode in which ergot destroys the life of the child is explained. The question may be easily solved, by making an instant examination of the mother, in every case of still-birth after the use of ergot." *The Charleston Med. Jour. and Review*, edited by P. C. Gaillard, M. D., and H. W. DeSaussure, M. D. March, 1849, p. 197-8.